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HAZARD DIVISION 1.2 TESTS - INSTRUMENTATION RESULTS AND INTERPRETATION

BY MICHAEL M. SWISDAK, JR. AND KENT W. RYE

WEAPONS RESEARCH AND TECHNOLOGY DEPARTMENT

9 MARCH 1994

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DAHLGREN DIVISION • WHITE OAK DETACHMENT

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FOREWORD


This work was jointly sponsored by the United Kingdom Explosives Storage and Transport Committee (ESTC) and the United States Department of Defense Explosives Safety Board (DDESB).

The program was, truly, a team effort. The fielding at the Naval Air Warfare Center, Weapons Division, China Lake, California, was under the direction of Mr. Carl Halsey. The airblast/temperature measurements and analyses were made by the Explosion Damage Branch (Code R14) of the Dahlgren Division of the Naval Surface Warfare Center. The fragmentation/debris collection and analysis was under the direction of Mr. W. D. Houchins of the Explosion Dynamics Branch (Code G64) also of this Division.

The guidance provided by Dr. J. M. Ward of the DDESB Secretariat and Mr. M. J. A. Gould of the ESTC was greatly appreciated.

The mention of proprietary or company names in this report is for technical information purposes only. No endorsement or criticism is intended.

Approved by:


KURT F. MUELLER, Head
Explosives and Warheads Division

ABSTRACT

To date, nearly all efforts in the field of accidental explosion consequence determination have been aimed at the quantification of the effects of a Hazard Division (HD) 1.1 event. Little attention has been paid to the consequences of the ignition of stacks of HD 1.2 ammunition. In 1989, NATO AC/258 (Group of Experts on the Safety Aspects of Transportation and Storage of Military Ammunition and Explosives) agreed that a program of trials should be carried out to investigate the consequences of an HD 1.2 event. The goal of these trials would be twofold: to gain basic knowledge about HD 1.2 phenomena and to revise the current NATO quantity-distance relationships for HD 1.2 events.

As a result of the NATO interest, a joint United Kingdom/United States (UK/US) experimental program was started in 1990. To date, six tests have been conducted: three single-pallet tests (30 projectiles/test), two 8-pallet tests (240 projectiles/test), one 27-pallet test (864 projectiles). This report describes the test program and the instrumentation used and summarizes the instrumentation results which have been obtained.

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CHAPTER 1

INTRODUCTION

To date, nearly all international effort in the field of accidental explosion consequence determination has been aimed at the quantification of the effects of a Hazard Division (HD) 1.1 (mass detonation) event in an explosives storage facility. Tests such as those carried out in Australia,¹⁻⁴ France,⁵ and the United States⁶⁻⁹ over recent years have assessed the effects of blast and fragment throw from accidental mass explosions in brick and concrete storehouses, igloos, and tunnel magazines.

Little attention has been paid to quantifying the consequences of the accidental initiation of HD 1.2 ammunition. This class of ammunition is not expected to explode en masse. Individual rounds or small groups of rounds will explode when sufficiently stimulated (by, for example, fire) without causing others around them to explode. Such explosions will continue spasmodically over a period as further rounds receive sufficient stimulus.

In 1989, NATO AC/258 (Group of Experts on the Safety Aspects of Transportation and Storage of Military Ammunition and Explosives), acknowledging the frailty of the basis for their HD 1.2 Quantity-Distances (Q-Ds), agreed that a program of trials should be carried out to investigate the consequences of an accidental HD 1.2 event. Exposed stack trials and trials within typical storehouse structures were proposed. This program would also offer the opportunity for the development of an approach common to and acceptable to NATO, the United Kingdom (UK), and the United States (US) for the calculation of HD 1.2 safety distances.

To enable the program of trials to proceed in a short time scale, the UK Explosives Storage and Transport Committee (ESTC) and the US Department of Defense Explosives Safety Board (DDESB) agreed to finance jointly an initial series of trials to examine the consequences of the accidental ignition of stacks of HD 1.2 ammunition in the open.

This report describes the testing methodology, the test program, and the instrumentation which was used on the tests, and presents the instrumentation results. The fragmentation/debris collection and interpretation will be discussed in a separate report.

CHAPTER 2

TEST PROGRAM

The test program consists of a series of bonfire tests on various sized stacks of HD 1.2 items stored in the open. Six tests have been completed in this phase of the testing program. The test details are presented in Table 2-1. All of these tests were conducted at the Naval Air Warfare Center, Weapons Division, China Lake, California.

TEST ITEM

The ammunition which has been tested to date is the M1 105mm cartridge. This is a semi-fixed, high-explosive artillery round. The projectile body is fabricated from forged steel and weighs approximately 25.8 pounds. An aluminum shipping plug is assembled into the nose of the projectile in lieu of a fuze. The propelling charge is comprised of approximately 3 pounds of M1 propellant contained in a spiral wrap steel case. Each propelling charge case weighs approximately 4.7 pounds and is made of brass. All of the tests which are being described in this report used TNT as the explosive fill.

The cartridges are packaged in wooden boxes for transport and storage. Each box contains two cartridges that are oriented such that the projectile of one cartridge is adjacent to the propelling charge of the other cartridge (i.e., nose-to-tail arrangement). A complete pallet consists of 15 or 16 boxes, depending on the stacking arrangement. The boxes are secured on the pallet using steel banding.

TEST METHOD

The first four tests were conducted generally in accordance with the methodology prescribed in the *UN Recommendations on the Transport of Dangerous Goods, Tests and Criteria (Second Edition)* (the UN Orange Book).¹⁰ The test items were stacked on a test stand that provided approximately 30 inches of clearance between the bottom of the stack and the ground level. Dried lumber placed beneath the test stand and around the pallets was used as kindling to provide fuel during the initial stages of the test. Four shallow troughs containing a small amount of gasoline were placed around the base of the stack to provide an ignition source for the fire. The gasoline in the troughs was ignited with an electric squib. In order to eliminate ground

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cratering and burrowing of unexploded test items in the ground zero area, the stack and bonfire were constructed over a steel plate that was supported by a concrete pad.

The fifth and sixth tests were conducted in a similar manner except that the kindling was placed beneath the test stand only. This was done to simulate a more probable accident scenario in which the test item packaging and the energetic components are the primary fuel source for a fire.

TABLE 2-1. TEST INFORMATION

TEST NUMBER	NUMBER OF PALLETS	BOXES PER PALLET	NUMBER OF ROUNDS	TEST DATE	INSTRUMENTATION
1	1	15	30	7-May-91	photography
2	1	15	30	24-Jun-91	photography, airblast
3	1	15	30	29-Jul-91	photography, airblast
4	8	15	240	29-Oct-91	photography, airblast
5	8	15	240	29-Apr-92	photography, airblast
6	27	16	864	28-Oct-92	photography, airblast, temperature

CHAPTER 3

INSTRUMENTATION

AIRBLAST

This chapter describes the transducers and instrumentation that were used during the HD 1.2 Tests. The first five tests, tests 1 through 3 (single pallet of projectiles) and tests 4 and 5 (eight pallets of projectiles), used eight pressure gauges located at the 0 and 90 degree radii as shown in Figure 3-1. Four gauges were located on each radii at nominal ranges of 50, 70, 100, and 200 feet from the center of the pallet or stack of pallets. Each gauge was mounted 2 feet above the ground. Gauge positions were labeled P1 through P8 as shown in Figure 3-1.

Test 6, using 27 pallets of projectiles, used 12 pressure gauges located along the 0, 90, and 225 degree radials as shown in Figure 3-1. Four gauges were located on each line at nominal ranges of 50, 70, 100, and 200 feet from ground zero. Gauge positions were labeled P1 through P12 for this test. Also during test 6, a fiber optic zero time transducer was used so that the projectiles' initiation time could be determined. This will be discussed in more detail below.

The pressure gauges that were used during the tests are the Atlantic Research Corporation Blast Pressure Gauge Model LC-33. The sensing element is piezoelectric and mounted in a "pencil" type housing as shown in Figure 3-2. The output of the gauge is connected to a source follower amplifier (PCB Model 402A02) located near the gauge. The PCB source follower amplifier is powered and conditioned through the PCB Power Unit Model 494A06. The gauge-amplifier was located approximately 600 feet from the power unit and recording system. The overall frequency response of the gauge and conditioning system is 0.5 to 100,000 Hz.

FIBER OPTIC ZERO TIME SENSOR

During the 27 pallet test (test 6), a zero time fiber optic sensor was used to determine the initial reaction time of each event. The fiber optic zero time sensor consisted of four parts: (1) fiber optic input block, (2) interconnecting fiber optic cable, (3) photoconductor, and (4) amplifier and filter. Figure 3-3 shows the fiber optic input block and a schematic of the photoconductor-amplifier circuit. The fiber optic input block was configured in this way in order to expand the sensor's field of view. The optic sensor used was the Clairex CL-704L photoconductor. This was used mainly because of its availability and because of its low resistance characteristics. The Texas Instruments TI-054 operational-amplifier was used at a gain of approximately 1000. The circuit also has a high pass filter set to 2,000 Hz, removing the slower

intensity changes of the cook-off fire from the dynamic flare-up produced by each event.

TEMPERATURE

On test 6 (27-pallet test), an attempt was made to measure the temperature on both the outside and inside of several of the boxes. High temperature Type K thermocouples were used. The locations of these sensors are shown in Figure 3-4.

The thermocouples were connected to an Analog Devices AD595 thermocouple amplifier with a built-in cold junction compensator. The circuit was packaged and buried approximately 30 feet from the center of the pallet stack. The output of the amplifiers were connected to a Honeywell Model 101 (HW101) FM tape recorder located approximately 600 feet away. Time code was also recorded on the tape so that the temperature data could be coordinated with the blast data. The tape recorder was operated at a speed of 15 inches per second (ips) which gave a recording time of approximately 2 hours and a frequency response of DC to 10 KHz. The recorder was operated manually and was turned on before leaving the test site.

REMOTE INSTRUMENTATION FLOAT SYSTEM

The pressure measurements were recorded remotely using a radio controlled instrumentation system. The instrumentation system was designed originally for recording shockwave measurements near large underwater explosions; it was designed to be placed on a remote floating platform. Thus it is named the Remote Instrumentation Float (RIF) System. Appropriate modifications were made in order to meet the requirements of the HD 1.2 tests. A remote controlled recording system was required because of the lack of appropriate shelter for instrumentation and personnel at the test site. Tests 1 through 3 used one RIF System and tests 4 through 6 used two systems. Two systems were required because a single system had a recording duration that was potentially too short to record the complete test. Thus, two RIF Systems were used in series with a short time of recording overlap.

The RIF System is a rugged, shock mounted, air-conditioned, self-contained recording system. The instrumentation can be powered with battery/inverter systems or a portable generator. The overall RIF System is shown in block diagram form in Figure 3-5. The RIF System is controlled by a master remote control station that sends commands and receives the remote RIFs' status reports through dual tone multi-frequency encoded radio transmissions. Five-watt Motorola PT500 FM transceivers are used for these transmissions. During this test series, the recording system was controlled from a distance of approximately 4000 feet.

The FM tape recorder used in the RIF System is the HW101. During the tests, the recorder was set for Wideband I recording and the data was recorded at 30 ips to give a frequency response of DC to 20 KHz. The 9600-foot tapes which were used during the tests gave approximately 58 minutes of recording time. The HW101 is operated in the remote mode which enables operation of front panel controls through the remote connector. Through this connector, the HW101's status is also monitored.

The RIF System is powered by two sets of battery/inverter systems for DC and AC power. One set has two 80-ampere-hour batteries and an inverter that supplies power to the data collection electronics; power is switched on by the remote control electronics, and the batteries operate for 60 minutes. The other set has a 40-ampere-hour battery and inverter that supplies power to the remote control electronics for up to 10 hours of operation. The RIF System can also be powered by a portable gasoline powered generator. Due to the long recording times required for these tests, generators were mostly used.

DATA REDUCTION

Data reduction of the information recorded during testing was done at the Naval Surface Warfare Center White Oak Detachment (NSWCWO DET). Tests 1 through 5 were analyzed using a Hewlett Packard HP1000A minicomputer system that digitizes and processes data previously recorded on analog tape recorders. These systems provide laserjet plots along with the capability of providing ASCII data files that can be used on personal computers. A block diagram of the system is shown in Figure 3-6. The computer system was recently upgraded and expanded to include four Hewlett Packard HP9000/700 series workstations and Kinetic Systems transient recorders/digitizers. This system was used for digitizing and processing the data for test 6. Also incorporated in the data reduction system was a time code reader with a time code latch circuit. The time code latch circuit freezes the time code reader display when a signal is input into the circuit. Thus, when the trigger latch circuit was connected to a recorder data channel output, the shockwave signal would latch time code and show the time the event occurred.

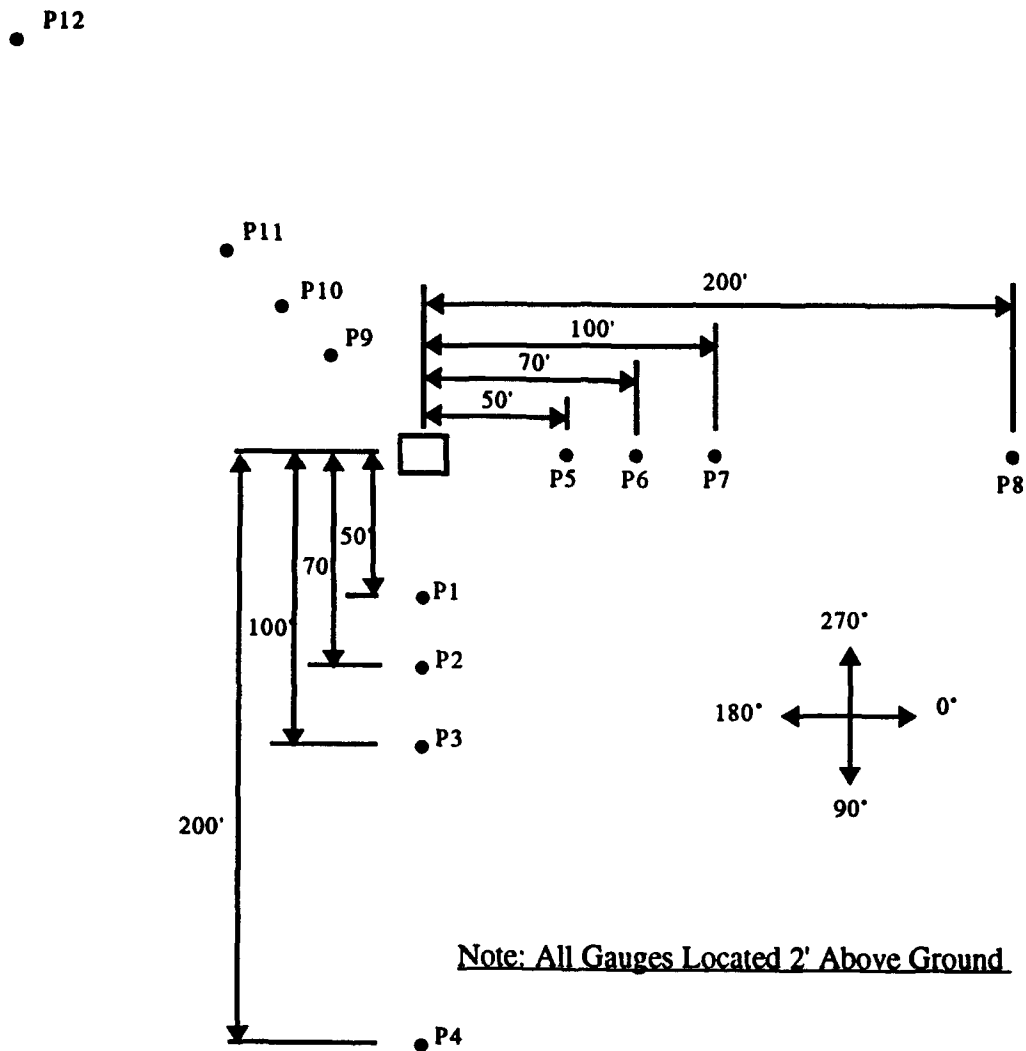


FIGURE 3-1. PRESSURE GAUGE LOCATIONS

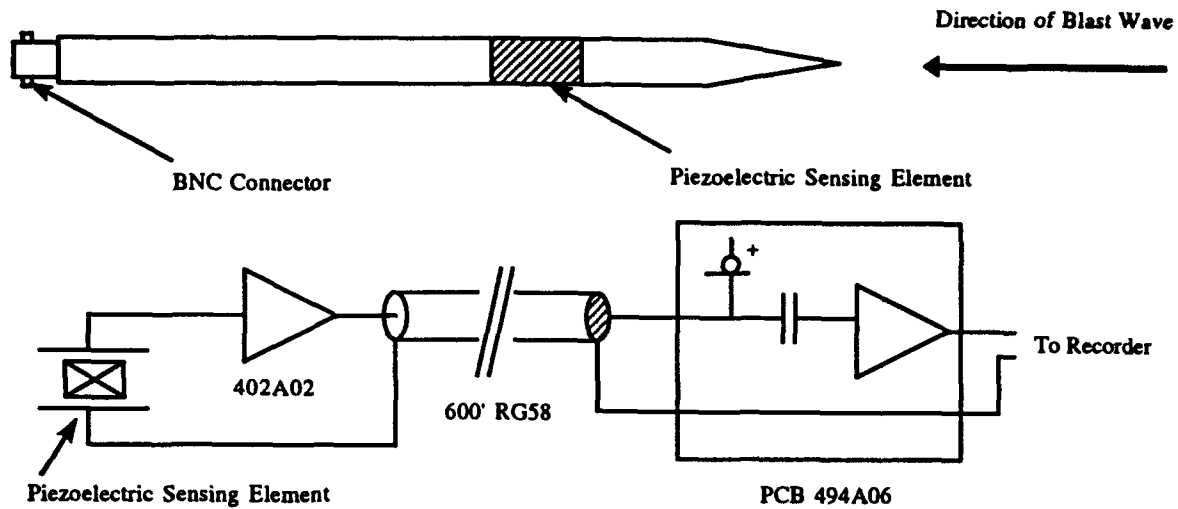


FIGURE 3-2. MODEL LC-33 PRESSURE GAUGE AND CIRCUIT SCHEMATIC

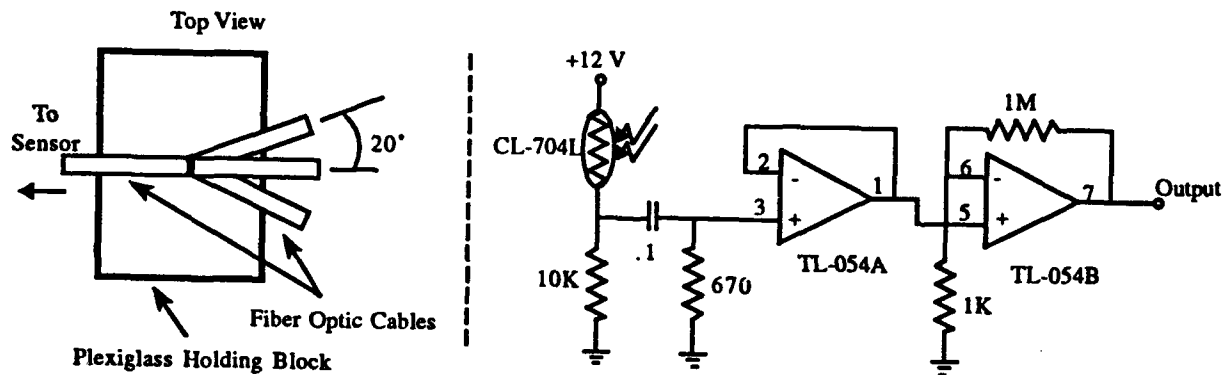


FIGURE 3-3. FIBER OPTIC INPUT BLOCK AND CIRCUIT SCHEMATIC

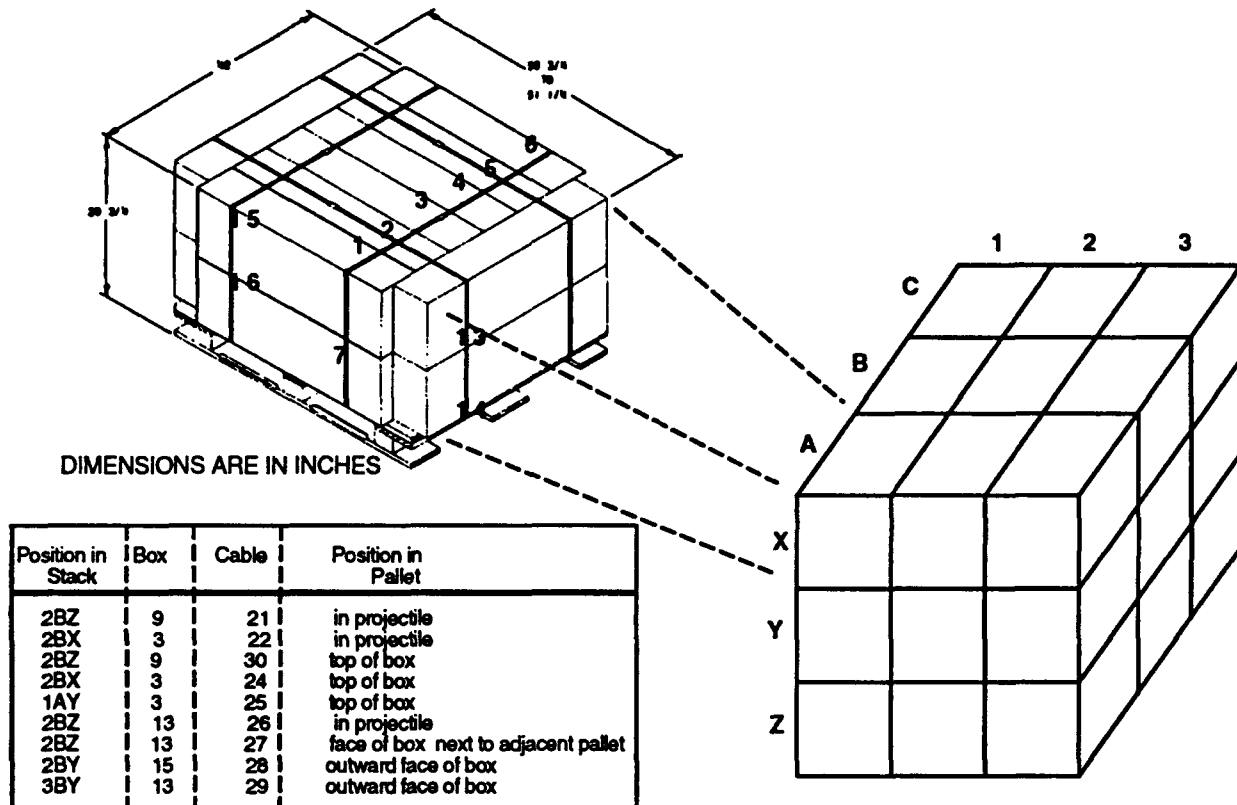


FIGURE 3-4. THERMOCOUPLE LOCATIONS

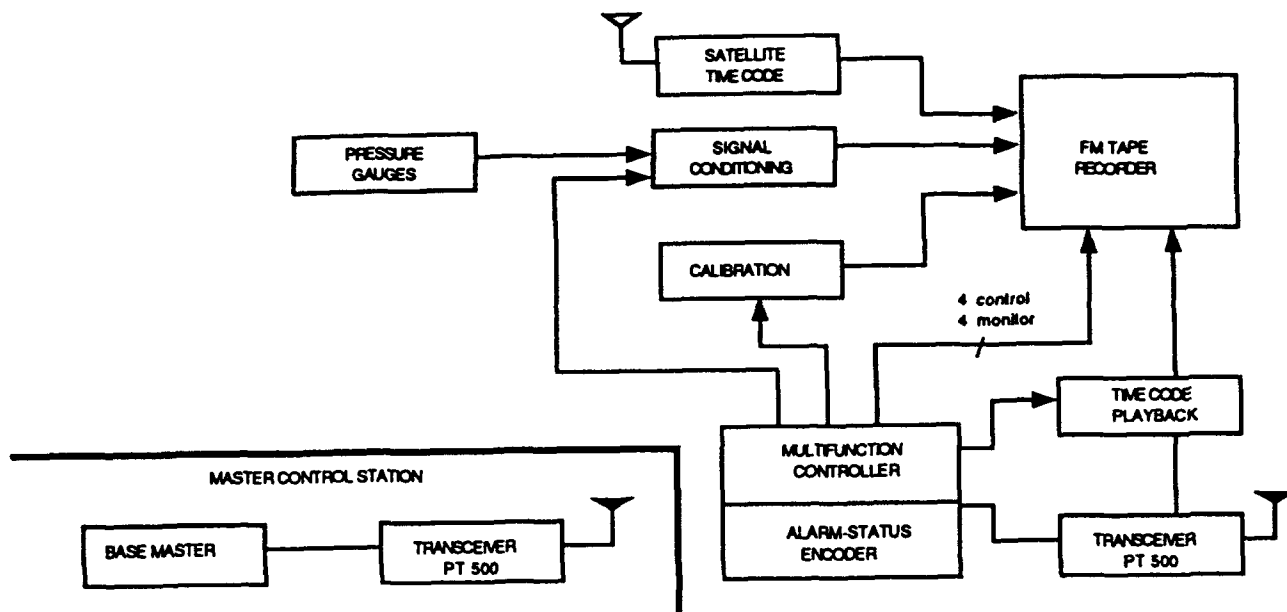


FIGURE 3-5. RIF SYSTEM BLOCK DIAGRAM

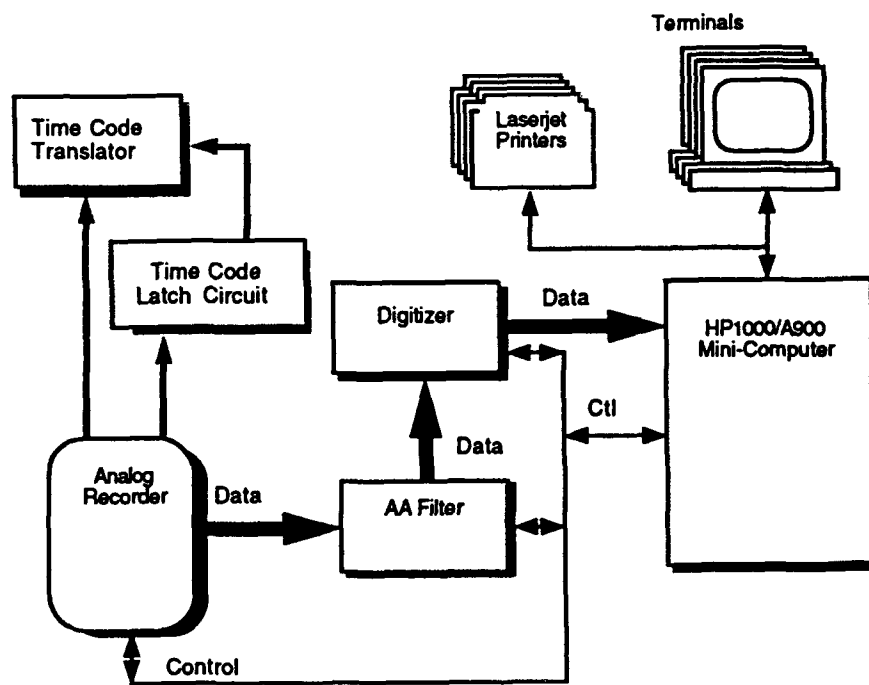


FIGURE 3-6. DATA REDUCTION COMPUTER SYSTEM

CHAPTER 4

RESULTS

This chapter presents the instrumentation results which have been obtained to date during this testing effort. The data will be presented in the following sequence for each test. First, a table showing the event time of each reaction--referenced to Standard IRIG Time Code. Also included on this table are the event times recorded by an on-site observer and the elapsed times computed from the event times. Next, a table presenting the airblast peak pressures as a function of position for each event. For test 6, two additional tables will be presented--one presenting arrival times and derived event locations for each event and one presenting the temperatures which were recorded.

Selected pressure-time waveforms will be presented for each test. All of the temperature-time records which were recorded during test 6 will also be presented.

TEST 1

This test was of a single pallet of projectiles (total of 30 projectiles) and was conducted in May 1991. Due to shipping problems, the instrumentation did not arrive at the test site in time. Therefore, there are no airblast data for this test. Table 4-1 presents the event times which were determined from a video taken during the event. Thirteen events were recorded and seventeen projectile bodies were recovered--accounting for all 30 projectiles.

TEST 2

The second test was also a single pallet of projectiles; it was conducted in June 1991. Nine events or major reactions were recorded on this test. Table 4-2 presents the times of each of these events--relative to both the start of the fire and the first major reaction. The peak pressures from the nine reactions are shown in Table 4-3. A true zero-time for each event was not available; zero time for events 2 through 9 were arbitrarily referenced to 20 ms before gauge P2. No signal was received from gauge P1. Since no zero time was available, shock arrival time at each position and, hence, event location, could not be determined. Nine events were recorded; 21 projectile bodies were recovered--accounting for all 30 projectiles.

TEST 3

The third test involved a single pallet of projectiles and was conducted on 29 July 1991. Eleven events or major reactions occurred on this test. However, the last two events happened after the shutdown of the tape recorder (more than 1 hour after the start of the fire). Table 4-4 presents the times of each of the first nine events--relative to both the start of the fire and the first major reaction. The peak pressures from the nine reactions that were recorded are shown in Table 4-5. A true zero-time for each event was not available; zero time for events 1 through 8 were arbitrarily referenced to 25 ms before gauge P2. Zero time for event 9 was referenced to 10 ms before gauge P5. Since no zero time was available, shock arrival time at each position and, hence, event location, could not be determined. Eleven events were recorded; 19 projectile bodies were recovered--accounting for all 30 projectiles.

TEST 4

The fourth test consisted of eight pallets of projectiles (total of 240 projectiles) and was conducted on 29 August 1991. Following the test, 174 projectile bodies were recovered intact--indicating that 66 projectiles had reacted. Based on the on-site observations and the pressure instrumentation, 68 events or major reactions occurred. Table 4-6 presents the times of each of these events--relative to both the start of the fire and the first major reaction. The peak pressures from the reactions that were recorded are shown in Table 4-7. A true zero-time for each event was not available. Zero time for all events except the events listed below were referenced to 35 ms before gauge P6. Zero time for events 47, 55, and 60 were referenced to 65 ms before gauge P6. Zero time for event 3 was referenced to 60 ms before gauge P7. Zero time for event 10 was referenced to 35 ms before gauge P2. The pressure data for the two 50-foot range gauges (P1 and P5) during the first half of the reactions appear anomalous. This may be due to the gauges close proximity to the fire--thus heating the gauges beyond their operating temperature range. Since no zero time was available, shock arrival time at each position and, hence, event location, could not be determined. The pressure instrumentation indicated more reactions than there were missing projectiles--this discrepancy can be attributed to propellant-type reactions which were mistaken for projectile reactions. If a true zero time had been available, allowing the location of each event to be determined, then these propellant reactions could have been identified (see test 6).

TEST 5

The fifth test again consisted of eight pallets of projectiles and was conducted on 29 April 1992. Following the test, 174 projectile bodies were recovered intact--indicating that 66 projectiles had reacted. Based on the on-site observations and the pressure instrumentation, 69 events or major reactions occurred. Table 4-8 presents the times of each of these events--relative to both the start of the fire and the first major reaction. The peak pressures from the reactions that were recorded are shown in Table 4-9. A true zero-time for each event was not available. Zero time for all events except the events listed below were referenced to 35 ms before gauge P6. Zero time

for events 33, 50, 51, and 52 were referenced to 65 ms before gauge P2. There was no signal received from gauge P7. Since no zero time was available, shock arrival time at each position and, hence, event location, could not be determined. The pressure instrumentation indicated more reactions than there were missing projectiles--this discrepancy can be attributed to propellant-type reactions which were mistaken for projectile reactions. If a true zero time had been available, allowing the location of each event to be determined, then these propellant reactions could have been identified (see test 6).

TEST 6

The sixth test consisted of 27 pallets with each pallet containing 32 projectiles for a total of 864 projectiles. This test was conducted on 28 October 1992. Following the test, 546 projectile bodies were recovered intact--indicating that 318 projectiles had reacted. Based on the on-site observations and the preliminary pressure instrumentation, 324 events or major reactions occurred. Table 4-10 presents the times of each of these events--relative to both the start of the fire and the first major reaction. The peak pressures from the reactions that were recorded are shown in Table 4-11. A zero-time sensor was available for this event, therefore, shock time of arrival can also be determined. This is presented in Table 4-12.

The gauge at location P1 gave inconsistent results and was not included in the pressure tabulation. There are several event numbers for which no event time was measured. This could be due to any of several causes. Two of the most likely, however, include: (1) the fiber optic zero time sensor becoming saturated from an event which occurred momentarily before the next reaction and (2) some reactions may have been shielded from the zero time sensor if the reaction occurred on the opposite side of the stack from which the sensor was located.

The difference between the number of events presented in Table 4-10 and the number of unrecovered projectiles can be attributed to propellant reactions. These reactions will be separated out and discussed in the following chapter.

Figure 4-1 presents a sample of the pressure-time waveforms which were recorded on this test. It presents the data recorded on one of the 324 events. Also presented is the shape of the zero time pulse which was recorded for this event.

According to Table 4-10, the first event occurred approximately 26 minutes after the start of the fire. The zero time for the thermocouple analysis was adjusted to the time for event 1. Any thermocouple readings taken beyond a time of approximately 25 minutes would, therefore, be suspect. The maximum temperatures which are reported in Table 4-13 are those which occur in the first 24 minutes of the fire.

Figure 4-2 presents the temperature-time waveforms which were recorded during the first 25 (or so) minutes of the fire. Figure 3-4 gives the location of each thermocouple in some detail.

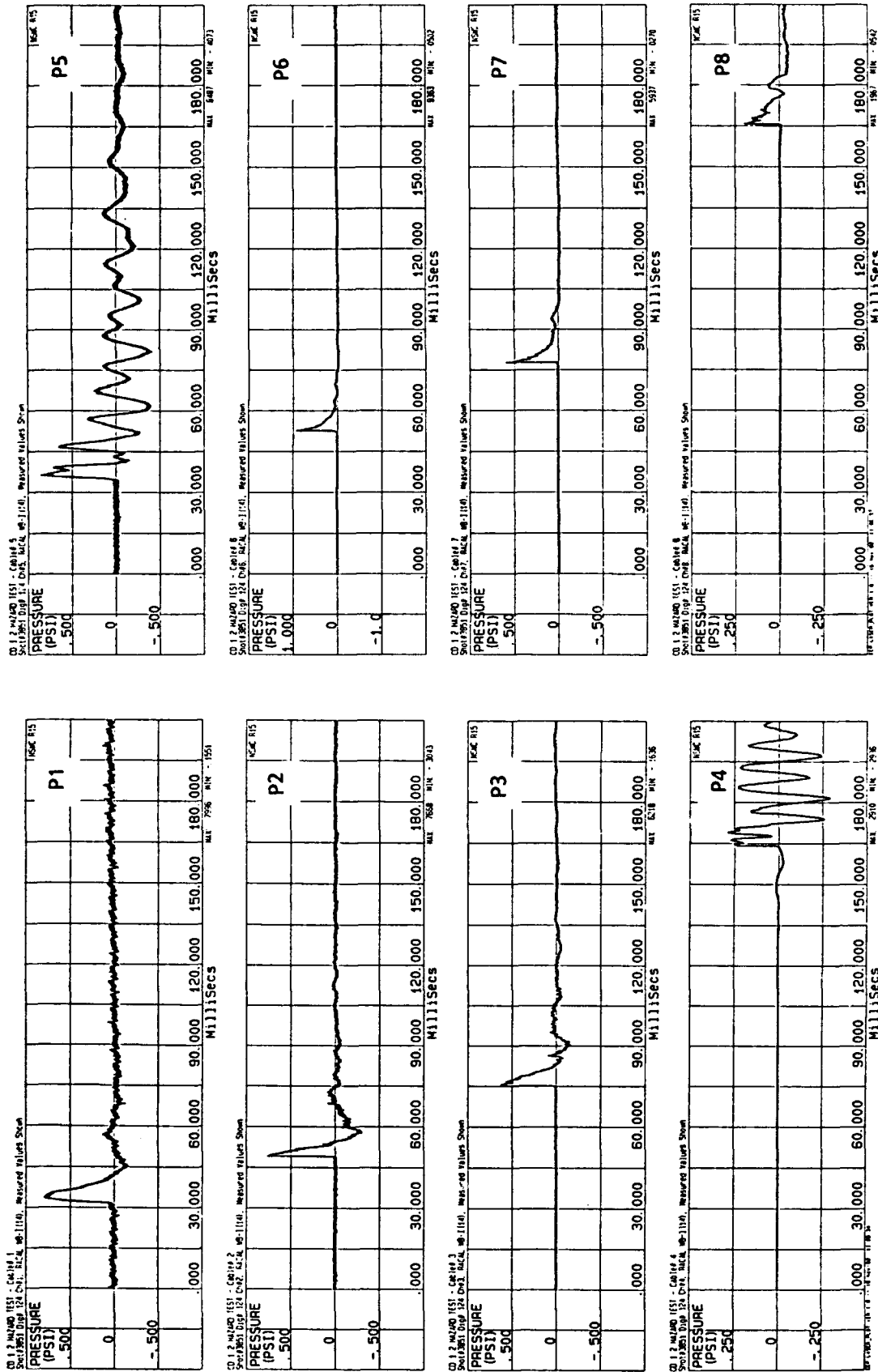


FIGURE 4-1. SAMPLE PRESSURE-TIME WAVEFORMS

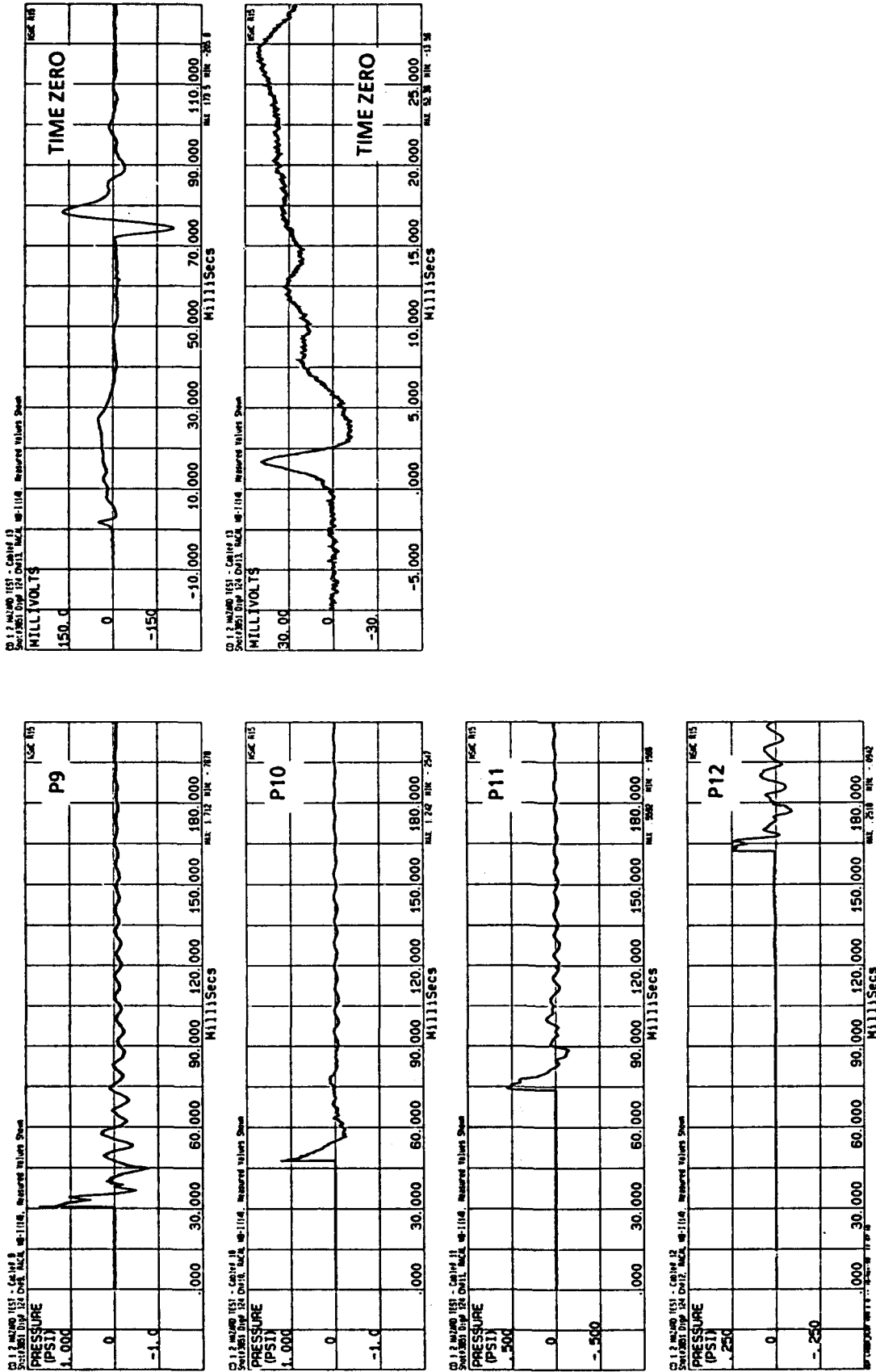


FIGURE 4-1. SAMPLE PRESSURE-TIME WAVEFORMS (Continued)

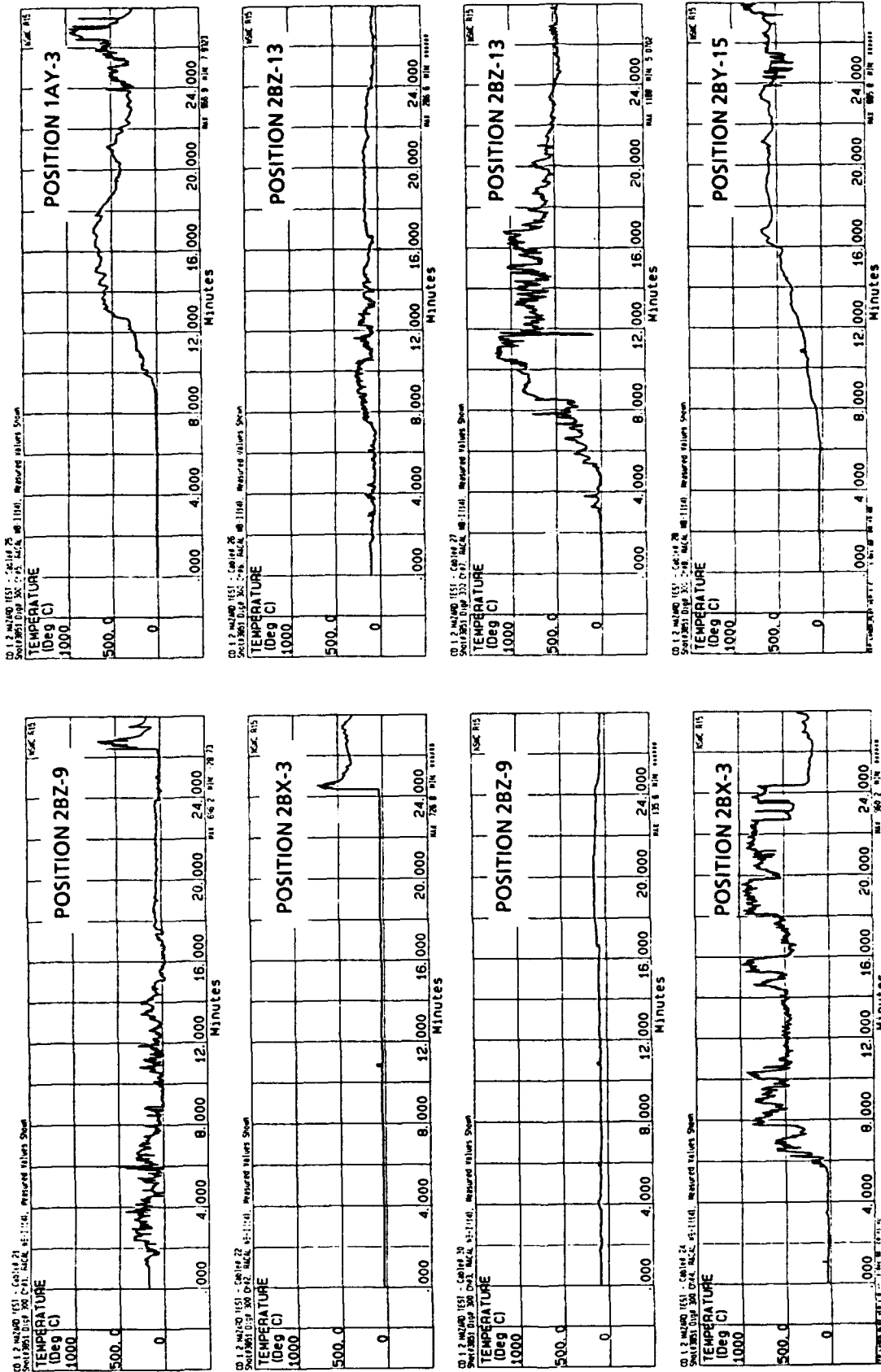


FIGURE 4-2. TEMPERATURE-TIME WAVEFORMS

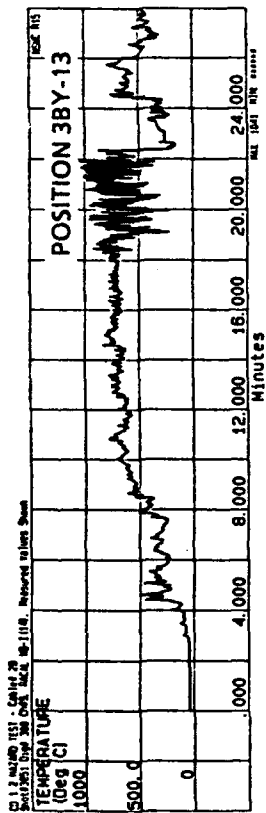


FIGURE 4-2. TEMPERATURE-TIME WAVEFORMS (Continued)

TABLE 4-1. TEST 1 EVENT TIMES

EVENT NUMBER	TIME CODE (h:m:s)	VIDEO EVENT TIME* (h:m:s)	ELAPSED TIME TIME CODE** (h:m:s)	ELAPSED TIME VIDEO.** (h:m:s)
1	NO INSTRUMENTATION	0:18:24	NO INSTRUMENTATION	
2	NO INSTRUMENTATION	0:18:51	NO INSTRUMENTATION	0:00:27
3	NO INSTRUMENTATION	0:19:58	NO INSTRUMENTATION	0:01:34
4	NO INSTRUMENTATION	0:20:43	NO INSTRUMENTATION	0:02:19
5	NO INSTRUMENTATION	0:20:55	NO INSTRUMENTATION	0:02:31
6	NO INSTRUMENTATION	0:27:40	NO INSTRUMENTATION	0:09:16
7	NO INSTRUMENTATION	0:27:44	NO INSTRUMENTATION	0:09:20
8	NO INSTRUMENTATION	0:28:50	NO INSTRUMENTATION	0:10:26
9	NO INSTRUMENTATION	0:29:34	NO INSTRUMENTATION	0:11:10
10	NO INSTRUMENTATION	0:29:51	NO INSTRUMENTATION	0:11:27
11	NO INSTRUMENTATION	0:33:48	NO INSTRUMENTATION	0:15:24
12	NO INSTRUMENTATION	0:35:21	NO INSTRUMENTATION	0:16:57
13	NO INSTRUMENTATION	0:48:53	NO INSTRUMENTATION	0:30:29

*referenced to start of fire--data taken from video post-test

**measured from first event

TABLE 4-2. TEST 2 EVENT TIMES

EVENT NUMBER	TIME CODE (h:m:s)	W.D.H. EVENT TIME* (h:m:s)	ELAPSED TIME TIME CODE** (h:m:s)	ELAPSED TIME W. D. H.** (h:m:s)
1	10:15:43	0:24:14		
2	10:18:30	0:27:00	0:02:47	0:02:46
3	10:22:26	0:31:55	0:06:43	0:07:41
4	10:24:54	0:33:24	0:09:11	0:09:10
5	10:25:02	0:33:31	0:09:19	0:09:17
6	10:29:53	0:38:23	0:14:10	0:14:09
7	10:30:38	0:39:08	0:14:55	0:14:54
8	10:32:32	0:41:03	0:16:49	0:16:49
9	10:34:05	0:42:35	0:18:22	0:18:21

*referenced to start of fire--W.D.H. is an onsite observer

**measured from first event

TABLE 4-3. TEST 2 PRESSURE DATA

EVENT NUMBER	PEAK PRESSURE (psi)							
	POSITION NUMBER							
	P1 (49 ft)	P2 (69 ft)	P3 (99 ft)	P4 (199 ft)	P5 (48.8 ft)	P6 (68.8 ft)	P7 (99 ft)	P8 (198.8 ft)
1	NR	0.19	0.12	0.04	NR	0.34	0.22	NR
2	NR	0.22	0.14	0.07	NR	0.35	0.21	0.05
3	NR	0.24	0.17	0.08	NR	0.72	0.41	0.16
4	NR	0.60	0.21	0.05	NR	0.83	0.50	0.22
5	NR	0.11	NR	0.03	NR	0.46	0.24	0.10
6	NR	0.27	0.17	0.07	NR	0.48	0.30	0.11
7	NR	0.53	0.39	NR	NR	1.25	0.66	0.26
8	NR	0.52	NR	0.12	NR	0.63	0.37	NR
9	NR	0.73	0.33	0.15	NR	0.90	0.50	0.17

NR: No Record

TABLE 4-4. TEST 3 EVENT TIMES

EVENT NUMBER	TIME CODE (h:m:s)	W.D.H. EVENT TIME* (h:m:s)	ELAPSED TIME TIME CODE** (h:m:s)	ELAPSED TIME W. D. H.** (h:m:s)
1	11:44:16	0:36:48		
2	11:54:33	0:47:06	0:10:17	0:10:18
3	11:56:30	0:49:03	0:12:14	0:12:15
4	11:58:38	0:51:11	0:14:22	0:14:23
5	12:02:18	0:54:51	0:18:02	0:18:03
6	12:03:57	0:56:31	0:19:41	0:19:43
7	12:04:37	0:57:10	0:20:21	0:20:22
8	12:08:57	1:01:32	0:24:41	0:24:44
9	12:10:41	1:03:14	0:26:25	0:26:26
10	***	1:07:35	***	0:30:47
11	***	1:18:40	***	0:41:52

*referenced to start of fire--W.D.H. is an onsite observer

**measured from first event

***events occurred after tape recorder stopped

TABLE 4-5. TEST 3 PRESSURE DATA

EVENT NUMBER	PEAK PRESSURE (psi)							
	POSITION NUMBER							
	P1 (49 ft)	P2 (69 ft)	P3 (99 ft)	P4 (199 ft)	P5 (48.8 ft)	P6 (68.8 ft)	P7 (99 ft)	P8 (198.8 ft)
1	0.44	0.28	0.16	0.08	0.33	0.22	0.15	0.07
2	1.01	0.62	0.30	0.14	0.89	0.48	0.28	0.13
3	0.82	0.58	0.27	0.11	1.23	0.71	0.42	0.17
4	1.25	0.79	0.46	0.17	1.23	0.65	0.43	0.18
5	2.55	1.67	0.86	0.37	2.15	1.21	0.67	0.25
6	0.89	0.58	0.42	0.17	1.42	0.85	0.53	0.20
7	1.55	1.11	0.56	0.24	3.18	1.50	0.71	0.22
8	1.16	0.76	0.43	0.17	1.12	0.62	0.35	0.16
9	0.62	0.65	0.38	0.18	0.32	0.27	0.18	0.09
10*								
11*								

*events occurred after tape recorder stopped

TABLE 4-6. TEST 4 EVENT TIMES

EVENT NUMBER	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time TIME CODE** (h:m:s)	Elapsed time W. D. H. ** (h:m:s)
1	13:06:45	0:20:48		
2	13:09:44	0:23:48	0:02:59	0:03:00
3	13:09:54	0:23:59	0:03:09	0:03:11
4	13:11:48	0:25:51	0:05:03	0:05:03
5	13:12:29	0:26:32	0:05:44	0:05:44
6	13:12:34	0:26:37	0:05:49	0:05:49
7	13:13:10	0:27:13	0:06:25	0:06:25
8	13:13:33	0:27:36	0:06:48	0:06:48
9	13:13:41	0:27:44	0:06:56	0:06:56
10	13:13:55	0:27:45	0:07:10	0:06:57
11	13:14:19	0:28:21	0:07:34	0:07:33
12	13:14:26	0:28:30	0:07:41	0:07:42
13	13:15:20	0:29:23	0:08:35	0:08:35
14	13:15:20.15		0:08:35.15	
15	13:15:55	0:29:58	0:09:10	0:09:10
16	13:16:56	0:30:59	0:10:11	0:10:11
17	13:17:01	0:31:04	0:10:16	0:10:16
18	13:17:13	0:31:14	0:10:28	0:10:26
19	13:17:19	0:31:21	0:10:34	0:10:33
20	13:17:20.48		0:10:35.48	
21	13:17:20.49		0:10:35.49	
22	13:17:45	0:31:47	0:11:00	0:10:59
23	13:17:51	0:31:54	0:11:06	0:11:06
24	13:18:14	0:32:16	0:11:29	0:11:28
25	13:18:21	0:32:24	0:11:36	0:11:36
26	13:19:09	0:33:12	0:12:24	0:12:24
27	13:19:13	0:33:16	0:12:28	0:12:28
28	13:19:46	0:33:49	0:13:01	0:13:01
29	13:20:04	0:34:07	0:13:19	0:13:19
30	13:20:07	0:34:10	0:13:22	0:13:22
31	13:20:09	0:34:12	0:13:24	0:13:24
32	13:20:41	0:34:44	0:13:56	0:13:56
33	13:20:46	0:34:49	0:14:01	0:14:01
34	13:21:01	0:35:04	0:14:16	0:14:16
35	13:21:24	0:35:27	0:14:39	0:14:39
36	13:21:25	0:35:28	0:14:40	0:14:40
37	13:21:44	0:35:46	0:14:59	0:14:58
38	13:22:08	0:36:11	0:15:23	0:15:23
39	13:22:27	0:36:30	0:15:42	0:15:42
40	13:22:39	0:36:42	0:15:54	0:15:54
41	13:23:02	0:37:05	0:16:17	0:16:17
42	13:23:12	0:37:15	0:16:27	0:16:27
43	13:23:44	0:37:46	0:16:59	0:16:58

TABLE 4-6. TEST 4 EVENT TIMES (Continued)

EVENT NUMBER	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time TIME CODE** (h:m:s)	Elapsed time W. D. H. ** (h:m:s)
44	13:24:35	0:38:39	0:17:50	0:17:51
45	13:25:58	0:40:00	0:19:13	0:19:12
46	13:26:04	0:40:05	0:19:19	0:19:17
47	13:26:12	0:40:24	0:19:27	0:19:36
48	13:26:19	0:40:29	0:19:34	0:19:41
49	13:26:21.50	0:40:30	0:19:36.50	0:19:42
50	13:26:21.68	0:40:31	0:19:36.68	0:19:43
51	13:26:26	0:40:33	0:19:41	0:19:45
52	13:27:15.15	0:41:18	0:20:30.15	0:20:30
53	13:27:15.50	0:41:19	0:20:30.50	0:20:31
54	13:27:57	0:42:00	0:21:12	0:21:12
55	13:28:13	0:42:15	0:21:28	0:21:27
56	13:28:16	0:42:23	0:21:31	0:21:35
57	13:28:20	0:42:25	0:21:35	0:21:37
58	13:28:47	0:42:50	0:22:02	0:22:02
59	13:29:10	0:43:13	0:22:25	0:22:25
60	13:29:41	0:43:44	0:22:56	0:22:56
61	13:30:10	0:44:13	0:23:25	0:23:25
62	13:30:36	0:44:38	0:23:51	0:23:50
63	13:32:22	0:46:25	0:25:37	0:25:37
64	13:33:02	0:47:04	0:26:17	0:26:16
65	13:33:43	0:47:46	0:26:58	0:26:58
66	13:37:38	0:51:40	0:30:53	0:30:52
67	13:38:55	0:52:58	0:32:10	0:32:10
68	13:47:05	1:01:01	0:40:20	0:40:13

*referenced to start of fire--W.D.H. is an onsite observer

**measured from first event

TABLE 4-7. TEST 4 PRESSURE DATA

EVENT NUMBER	PEAK PRESSURE (psi)							
	POSITION NUMBER							
	P1 (49 ft)	P2 (69 ft)	P3 (99 ft)	P4 (199.5 ft)	P5 (48.8 ft)	P6 (68.8 ft)	P7 (99 ft)	P8 (198.8 ft)
1	1.05	0.64	0.42	0.15	NR	0.88	0.58	0.19
2	NR	0.24	0.15	0.04	0.21	0.15	0.08	0.03
3	NR	0.30	0.19	0.08	NR		0.10	0.04
4	NR	0.34	0.23	0.09	0.16?	0.21	0.16	0.07
5	NR	0.76	0.40	0.11	NR	0.52	0.33	0.14
6	NR	0.66	0.38	0.11	0.44	0.41	0.27	0.12
7	NR	0.34	0.19	0.07	NR	0.24	0.18	0.07
8	NR	0.48	0.33	0.05	NR	0.33	0.23	0.09
9	NR	0.73	0.55	0.09	NR	0.38	0.21	0.11
10	NR	0.13	0.05	0.01	NR	NR	NR	NR
11	NR	0.66	0.44	0.07	NR	1.21	0.76	0.22
12	NR	NR	0.19	0.03	NR	0.25	0.18	0.06
13	NR	NR	0.42	0.12	NR	1.13	0.82	0.28
14	NR	NR	0.26	0.09	NR	1.04	0.68	0.24
15	NR	0.51	0.29	0.10	0.32	0.23	0.17	0.07
16	NR	0.41	0.25	0.10	NR	0.51	0.38	0.16
17	NR	0.32	0.21	0.09	NR	0.95	0.69	0.25
18	NR	0.84	0.47	0.19	NR	0.79	0.58	0.20
19	NR	0.76	0.44	0.19	NR	0.49	0.35	0.18
20	NR	0.48	0.41	0.24	NR	0.49	0.35	0.18
21	NR	0.65	0.37	0.18	NR	0.36	0.23	0.09
22	NR	0.71	0.38	0.14	NR	0.65	0.48	0.17
23	NR	0.59	0.35	0.15	NR	0.60	0.37	0.15
24	NR	0.54	0.38	0.19	NR	0.81	0.55	0.19
25	NR	0.64	0.46	0.22	NR	0.53	0.40	0.17
26	0.75	0.16	0.13	0.07	NR	0.27	0.24	0.11
27	NR	1.25	0.75	0.36	NR	1.42	1.08	0.47
28	NR	0.28	0.19	0.10	NR	0.48	0.35	0.14
29	NR	0.61	0.38	0.19	NR	0.55	0.43	0.14
30	NR	0.76	0.45	0.19	NR	0.61	0.41	0.16
31	NR	0.18	0.12	0.08	NR	0.53	0.36	0.14
32	1.43	0.79	0.45	0.21	NR	0.92	0.57	0.24
33	NR	0.42	0.29	0.14	0.38	0.25	0.17	0.08
34	1.15	0.73	0.48	0.21	NR	0.60	0.40	0.17
35	1.13	0.66	0.42	0.18	NR	0.59	0.42	0.18
36	1.07	0.60	0.37	0.18	NR	0.66	0.39	0.17
37	0.72	0.44	0.30	0.12	NR	0.60	0.41	0.14
38	0.70	0.39	0.28	0.12	NR	0.42	0.31	0.12
39	1.59	0.95	0.56	0.24	NR	0.70	0.47	0.18
40	0.64	0.44	0.29	0.15	0.69	0.57	0.44	0.17
41	0.87	0.58	0.37	0.16	0.64	0.56	0.44	0.17
42	1.74	1.01	0.55	0.21	NR	1.31	0.63	0.29
43	1.22	0.62	0.37	0.17	NR	1.02	0.72	0.25
44	1.51	0.83	0.47	0.20	0.72	0.59	0.43	0.17
45	1.27	0.76	0.51	0.18	1.00	0.71	0.53	0.21
46	0.14	0.10	0.06	0.03	0.26	0.18	0.15	0.06

TABLE 4-7. TEST 4 PRESSURE DATA (Continued)

EVENT NUMBER	PEAK PRESSURE (psi)							
	POSITION NUMBER							
	P1 (49 ft)	P2 (69 ft)	P3 (99 ft)	P4 (199.5 ft)	P5 (48.8 ft)	P6 (68.8 ft)	P7 (99 ft)	P8 (198.8 ft)
47	2.38	1.17	0.68	0.23	0.65	0.43	0.31	0.16
48	1.77	0.98	0.54	0.19	0.98	0.71	0.47	0.18
49	0.68	0.40	0.26	0.14	1.22	0.97	0.65	0.29
50	1.37	0.81	0.41	0.19	0.60	0.48	0.37	0.16
51	1.40	0.80	0.48	0.21	0.76	0.50	0.35	0.15
52	2.29	1.13	0.60	0.23	0.82	0.60	0.41	0.17
53	0.60	0.46	0.31	0.16	0.677	0.82	0.66	0.19
54	2.19	1.61	0.53	0.22	.847	1.04	0.57	0.21
55	1.75	0.75	0.37	0.15	0.63	0.47	0.38	0.16
56	1.29	0.66	0.41	0.15	NR	1.03	0.63	0.21
57	1.35	0.81	0.42	0.20	NR	0.97	0.62	0.19
58	2.80	1.30	0.68	0.28	NR	0.90	0.57	0.20
59	1.19	0.58	0.39	0.19	0.92	0.65	0.40	0.13
60	0.51	0.39	0.47	0.49	0.31	0.29	0.29	0.18
61	1.82	0.91	0.50	0.19	.667	0.61	0.39	0.14
62	NR	0.67	0.44	0.17	1.12	0.77	0.57	0.21
63	NR	0.28	0.18	0.08	NR	0.67	0.50	0.17
64	NR	0.56	0.37	0.17	0.90	0.55	0.39	0.14
65	NR	1.20	0.62	0.27	1.11	0.76	0.47	0.19
66	1.24	0.68	0.38	0.16	0.93	0.75	0.53	0.17
67	2.25	1.09	0.60	0.22	1.06	0.71	0.50	0.21

NR: no useable record

TABLE 4-8. TEST 5 EVENT TIMES

Event #	Time Code (h:m:s)	W. D. H Event Time* (h:m:s)	Elapsed time Time Code** (h:m:s)	Elapsed time W. D. H. ** (h:m:s)
1	10:41:28	0:18:37	0:00:00	0:00:00
2	10:41:48	0:18:56	0:00:20	0:00:19
3	10:42:45	0:19:53	0:01:17	0:01:16
4	10:44:10	0:21:18	0:02:42	0:02:41
5	10:44:17	0:21:25	0:02:49	0:02:48
6	10:44:27	0:21:35	0:02:59	0:02:58
7	10:44:35	0:21:43	0:03:07	0:03:06
8	10:44:45	0:21:51	0:03:17	0:03:14
9	10:44:46	0:21:53	0:03:18	0:03:16
10	10:45:00	0:22:07	0:03:32	0:03:30
11	10:45:02	0:22:12	0:03:34	0:03:35
12	10:45:09	0:22:17	0:03:41	0:03:40
13	10:45:50	0:22:57	0:04:22	0:04:20
14	10:46:03	0:23:11	0:04:35	0:04:34
15	10:46:27	0:23:34	0:04:59	0:04:57
16	10:46:29	0:23:37	0:05:01	0:05:00
17	10:46:31	0:23:40	0:05:03	0:05:03
18	10:46:34	0:23:42	0:05:06	0:05:05
19	10:46:48	0:23:56	0:05:20	0:05:19
20	10:46:59	0:24:07	0:05:31	0:05:30
21	10:47:02	0:24:09	0:05:34	0:05:32
22	10:47:32	0:24:40	0:06:04	0:06:03
23	10:47:35	0:24:44	0:06:07	0:06:07
24	10:47:46.411	0:24:54	0:06:18.411	0:06:17
25	10:47:46.417		0:06:18.417	
26	10:47:47	0:24:55	0:06:19	0:06:18
27	10:47:56	0:25:04	0:06:28	0:06:27
28	10:48:02	0:25:09	0:06:34	0:06:32
29	10:48:07	0:25:15	0:06:39	0:06:38
30	10:48:09	0:25:18	0:06:41	0:06:41
31	10:48:20	0:25:28	0:06:52	0:06:51
32	10:48:28	0:25:38	0:07:00	0:07:01
33	10:48:29		0:07:01	
34	10:48:33	0:25:41	0:07:05	0:07:04
35	10:48:37	0:25:45	0:07:09	0:07:08
36	10:48:42.5	0:25:50	0:07:14.5	0:07:13
37	10:48:42.7	0:25:51	0:07:14.7	0:07:14
38	10:48:47	0:25:55	0:07:19	0:07:18
39	10:48:58	0:26:06	0:07:30	0:07:29
40	10:49:08	0:26:16	0:07:40	0:07:39
41	10:49:18	0:26:26	0:07:50	0:07:49
42	10:49:22	0:26:30	0:07:54	0:07:53
43	10:49:25	0:26:33	0:07:57	0:07:56
44	10:49:33	0:26:41	0:08:05	0:08:04
45	10:49:57	0:27:05	0:08:29	0:08:28

TABLE 4-8. TEST 5 EVENT TIMES (Continued)

Event #	Time Code (h:m:s)	W. D. H Event Time* (h:m:s)	Elapsed time Time Code** (h:m:s)	Elapsed time W. D. H. ** (h:m:s)
46	10:50:01	0:27:09	0:08:33	0:08:32
47	10:50:21	0:27:29	0:08:53	0:08:52
48	10:50:36	0:27:44	0:09:08	0:09:07
49	10:50:46	0:27:54	0:09:18	0:09:17
50	10:51:25	0:28:34	0:09:57	0:09:57
51	10:52:04	0:29:12	0:10:36	0:10:35
52	10:52:05	0:29:13	0:10:37	0:10:36
53	10:52:41.184	0:29:49	0:11:13.184	0:11:12
54	10:52:41.189		0:11:13.189	
55	10:52:41.950	0:29:50	0:11:13.950	0:11:13
56	10:52:41.959		0:11:13.959	
57	10:52:46	0:29:55	0:11:18	0:11:18
58	10:53:22	0:30:30	0:11:54	0:11:53
59	10:53:37	0:30:45	0:12:09	0:12:08
60	10:53:50	0:30:58	0:12:22	0:12:21
61	10:53:54	0:31:04	0:12:26	0:12:27
62	10:54:25	0:31:33	0:12:57	0:12:56
63	10:55:21	0:32:29	0:13:53	0:13:52
64	10:56:35	0:33:43	0:15:07	0:15:06
65	10:59:40	0:36:48	0:18:12	0:18:11
66	11:00:20	0:37:28	0:18:52	0:18:51
67	11:01:37	0:38:46	0:20:09	0:20:09
68	11:02:20	0:39:28	0:20:52	0:20:51
69	11:04:34	0:41:42	0:23:06	0:23:05

*referenced to start of fire--W. D. H. is an onsite observer

**measured from first event

TABLE 4-9. TEST 5 PRESSURE DATA

EVENT NUMBER	PEAK PRESSURE (psi)							
	POSITION NUMBER							
	P1 (49 ft)	P2 (69 ft)	P3 (99.3 ft)	P4 (199.5 ft)	P5 (48.8 ft)	P6 (68.8 ft)	P7 (99 ft)	P8 (198.8 ft)
1	0.52	0.37	0.19	0.10	1.19	0.69	NR	0.21
2	0.22	0.32	0.19	0.10	0.29	0.18	NR	0.05
3	0.47	0.44	0.23	0.10	0.43	0.31	NR	0.08
4	NR	1.15	0.52	0.21	2.07	1.84	NR	0.44
5	NR	0.35	0.18	0.09	0.50	0.30	NR	0.08
6	NR	0.39	0.21	0.11	1.91	0.97	NR	0.14
7	NR	0.43	0.26	0.12	2.11	1.47	NR	0.22
8	NR	0.36	0.20	0.11	0.29	0.22	NR	0.06
9	NR	0.58	0.27	0.10	1.15	0.96	NR	0.16
10	NR	0.21	0.13	0.06	0.36	0.24	NR	0.06
11	NR	0.31	0.23	0.08	NR	0.38	NR	0.11
12	NR	0.29	0.18	0.07	0.92	0.60	NR	0.09
13	NR	0.45	0.19	0.12	2.21	0.96	NR	0.36
14	NR	0.21	0.10	0.09	1.62	0.97	NR	0.20
15	NR	0.34	0.18	0.06	0.45	0.31	NR	0.08
16	NR	0.19	0.12	0.06	0.87	0.54	NR	0.10
17	NR	0.31	0.15	0.10	0.75	0.49	NR	0.10
18	NR	0.22	0.09	0.07	0.25	0.19	NR	0.05
19	NR	0.43	0.22	0.11	NR	1.57	NR	0.28
20	NR	0.31	0.16	0.09	0.70	0.36	NR	0.07
21	NR	0.30	0.19	0.09	0.60	0.44	NR	0.17
22	1.16	0.63	0.28	0.13	0.75	0.46	NR	0.13
23	0.46	0.32	0.22	0.09	1.00	0.61	NR	0.10
24	0.45	0.31	0.15	0.11	2.41	1.36	NR	0.21
25	0.45	0.31	0.18	0.11	2.40	1.51	NR	0.19
26	1.31	0.68	0.37	0.15	1.31	0.74	NR	0.16
27	1.06	0.55	0.29	0.12	NR	0.47	NR	0.14
28	0.83	0.47	0.21	0.11	0.86	0.70	NR	0.16
29	0.60	0.42	0.17	0.11	0.45	0.39	NR	0.10
30	1.26	1.05	0.62	0.24	0.37	0.43	NR	0.12
31	0.72	1.12	0.45	0.16	NR	0.33	NR	0.13
32	0.23	0.26	0.14	0.10	1.52	0.95	NR	0.24
33	0.61	0.43	0.22	0.12	0.22	0.15	NR	0.04
34	0.53	0.34	0.17	0.11	0.57	0.39	NR	0.10
35	0.85	0.44	0.25	0.10	0.97	0.81	NR	0.19
36	0.40	0.25	0.10	0.10	0.47	0.37	NR	0.12
37	1.86	0.89	0.46	0.18	0.49	0.46	NR	0.15
38	0.75	0.36	0.18	0.09	0.20	0.16	NR	0.05
39	1.29	0.71	0.37	0.14	0.64	0.36	NR	0.10
40	0.38	0.26	0.15	0.11	0.88	0.82	NR	0.13
41	0.58	0.36	0.20	0.13	0.42	0.59	NR	0.12
42	0.92	0.57	0.36	0.15	0.22	0.15	NR	0.05
43	0.50	0.33	0.22	0.10	0.64	0.46	NR	0.09
44	0.98	0.69	0.41	0.17	3.91	1.97	NR	0.26
45	0.57	0.36	0.26	0.10	0.20	0.19	NR	0.05
46	1.32	0.67	0.33	0.18	0.34	0.38	NR	0.13
47	0.59	0.37	0.25	0.12	0.19	0.21	NR	0.06
48	0.76	0.45	0.22	0.14	0.79	0.35	NR	0.12
49	1.27	0.66	0.31	0.18	0.34	0.30	NR	0.07

TABLE 4-9. TEST 5 PRESSURE DATA (Continued)

EVENT NUMBER	PEAK PRESSURE (psi)							
	POSITION NUMBER							
	P1 (49 ft)	P2 (69 ft)	P3 (99.3 ft)	P4 (199.5 ft)	P5 (48.8 ft)	P6 (68.8 ft)	P7 (99 ft)	P8 (198.8 ft)
50	0.83	0.48	0.30	0.11	0.81	NR	NR	0.11
51	0.38	0.25	0.13	0.09	0.64	NR	NR	0.08
52	0.85	0.47	0.25	0.13	0.53	NR	NR	0.12
53	1.42	0.67	0.27	0.16	0.74	0.39	NR	0.14
54	0.60	0.34	0.16	0.09	NR	NR	NR	0.06
55	1.60	0.76	0.44	0.21	1.46	0.36	NR	0.19
56	NR	0.53	0.33	NR	0.88	NR	NR	0.13
57	2.13	1.16	0.52	0.25	2.89	1.04	NR	0.31
58	1.26	0.59	0.29	0.14	1.44	0.33	NR	0.14
59	0.64	0.35	0.16	0.09	0.95	0.48	NR	0.14
60	0.23	0.16	0.08	0.07	0.60	0.51	NR	0.13
61	0.56	0.31	0.20	0.10	0.30	0.26	NR	0.08
62	0.75	0.40	0.24	0.11	0.76	0.57	NR	0.12
63	0.78	0.54	0.30	0.13	0.49	0.42	NR	0.13
64	1.00	0.63	0.38	0.16	1.28	0.81	NR	0.18
65	0.93	0.50	0.29	0.13	1.92	1.03	NR	0.19
66	1.26	0.77	0.46	0.17	1.66	0.92	NR	0.21
67	0.74	0.50	0.34	0.14	1.67	1.08	NR	0.26
68	1.33	0.76	0.38	0.20	2.26	1.13	NR	0.22
69	1.11	0.56	0.26	0.14	1.29	0.73	NR	0.16

NR: no useable record

TABLE 4-10. TEST 6 EVENT TIMES

Event Number	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time: TIME CODE** (h:m:s)	Elapsed time: W. D. H.** (h:m:s)
1	10:52:45.6	00:25:54	0:00:00.0	0:00:00.0
2	10:53:18.6	0:26:24	0:00:33.0	0:00:30.30
3	10:53:35.435	0:26:40	0:00:49.835	0:00:46.46
4	10:53:35.443		0:00:49.843	
5	10:53:52.2	0:26:57	0:01:06.6	0:01:03.3
6	10:55:58.7	0:29:04	0:03:13.1	0:03:10.10
7	10:56:00.7	0:29:10	0:03:15.1	0:03:16.16
8	10:56:34.4	0:29:39	0:03:48.8	0:03:45.45
9	10:57:04.3	0:30:09	0:04:18.7	0:04:15.15
10	10:57:24.3	0:30:29	0:04:38.7	0:04:35.35
11	10:57:24.8	0:30:35	0:04:39.2	0:04:41.41
12	10:57:37.9	0:30:43	0:04:52.3	0:04:49.49
13	10:57:43.5	0:30:48	0:04:57.9	0:04:54.54
14	10:58:09.34	0:31:14	0:05:23.74	0:05:20.20
15	10:58:10.0	0:31:15	0:05:24.4	0:05:21.21
16	10:58:14.6	0:31:19	0:05:29.0	0:05:25.25
17	10:58:33.5	0:31:38	0:05:47.9	0:05:44.44
18	10:58:41.5	0:31:46	0:05:55.9	0:05:52.52
19	10:58:59.9	0:32:05	0:06:14.3	0:06:11.11
20	10:59:07.4	0:32:12	0:06:21.8	0:06:18.18
21	10:59:11.153	0:32:16	0:06:25.553	0:06:22.22
22	10:59:11.160		0:06:25.56	
23	10:59:33.9	0:32:39	0:06:48.3	0:06:45.45
24	10:59:41.550	0:32:46	0:06:55.95	0:06:52.52
25	10:59:41.556		0:06:55.956	
26	10:59:45.918	0:32:51	0:07:00.318	0:06:57.57
27	10:59:45.925		0:07:00.325	
28	10:59:57.9	0:33:03	0:07:12.3	0:07:09.9
29	11:00:18.7	0:33:23	0:07:33.1	0:07:29.29
30	11:00:19.4	0:33:24	0:07:33.8	0:07:30.30
31	11:00:25.8	0:33:30	0:07:40.2	0:07:36.36
32	11:00:28.3	0:33:33	0:07:42.7	0:07:39.39
33	11:00:36.4	0:33:41	0:07:50.8	0:07:47.47
34	11:00:40.885	0:33:46	0:07:55.285	0:07:52.52
35	11:00:40.893		0:07:55.293	
36	11:00:47.7	0:33:52	0:08:02.1	0:07:58.58
37	11:00:48.0	0:33:55	0:08:02.4	0:08:01.1
38	11:00:51.079	0:33:59	0:08:05.479	0:08:05.5
39	11:00:51.087		0:08:05.487	
40	11:01:05.2	0:34:10	0:08:19.6	0:08:16.16
41	11:01:13.7	0:34:18	0:08:28.1	0:08:24.24
42	11:01:19.5	0:34:24	0:08:33.9	0:08:30.30
43	11:01:26.6	0:34:31	0:08:41.0	0:08:37.37
44	11:01:38.8	0:34:44	0:08:53.2	0:08:50.50
45	11:01:42.73	0:34:47	0:08:57.13	0:08:53.53
46	11:01:42.99	0:34:48	0:08:57.39	0:08:54.54
47	11:01:43.07		0:08:57.47	0:00:00.0
48	11:01:45.9	0:34:51	0:09:00.3	0:08:57.57

TABLE 4-10. TEST 6 EVENT TIMES (Continued)

Event Number	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time: TIME CODE** (h:m:s)	Elapsed time: W. D. H.** (h:m:s)
49	11:01:49.0	0:34:54	0:09:03.4	0:09:00.0
50	11:02:03.885	0:35:08	0:09:18.285	0:09:14.14
51	11:02:03.993		0:09:18.293	
52	11:02:09.654	0:35:14	0:09:23.954	0:09:20.20
53	11:02:09.660		0:09:23.96	
54	11:02:13.9	0:35:19	0:09:28.3	0:09:25.25
55	11:02:14.8	0:35:20	0:09:29.2	0:09:26.26
56	11:02:26.7	0:35:31	0:09:41.1	0:09:37.37
57	11:02:27.0	0:35:32	0:09:41.4	0:09:38.38
58	11:02:28.34	0:35:35	0:09:42.74	0:09:41.41
59	11:02:29.1	0:35:36	0:09:43.5	0:09:42.42
60	11:02:29.667	0:35:37	0:09:44.067	0:09:43.43
61	11:02:29.676		0:09:44.076	
62	11:02:39.510	0:35:44	0:09:53.91	0:09:50.50
63	11:02:39.517		0:09:53.917	
64	11:02:40.0	0:35:45	0:09:54.4	0:09:51.51
65	11:02:41.4	0:35:46	0:09:55.8	0:09:52.52
66	11:02:42.9	0:35:48	0:09:57.3	0:09:54.54
67	11:02:45.4	0:35:48	0:09:59.8	0:09:54.54
68	11:02:47.0	0:35:50	0:10:01.4	0:09:56.56
69	11:02:49.7	0:35:51	0:10:04.1	0:09:57.57
70	11:02:49.8	0:35:54	0:10:04.2	0:10:00.0
71	11:03:00.7	0:36:05	0:10:15.1	0:10:11.11
72	11:03:03.6	0:36:08	0:10:18.0	0:10:14.14
73	11:03:06.2	0:36:11	0:10:20.6	0:10:17.17
74	11:03:13.5	0:36:18	0:10:27.9	0:10:24.24
75	11:03:15.4	0:36:20	0:10:29.8	0:10:26.26
76	11:03:24.5	0:36:29	0:10:38.9	0:10:35.35
77	11:03:25.8	0:36:30	0:10:40.2	0:10:36.36
78	11:03:28.3	0:36:33	0:10:42.7	0:10:39.39
79	11:03:28.4	0:36:33	0:10:42.8	0:10:39.39
80	11:03:31.9	0:36:37	0:10:46.3	0:10:43.43
81	11:03:43.5	0:36:48	0:10:57.9	0:10:54.54
82	11:03:45.3	0:36:50	0:10:59.7	0:10:56.56
83	11:03:47.1	0:36:52	0:11:01.5	0:10:58.58
84	11:03:50.393	0:36:55	0:11:04.793	0:11:01.1
85	11:03:50.399		0:11:04.799	
86	11:03:52.6	0:36:57	0:11:07.0	0:11:03.3
87	11:03:53.944	0:36:58	0:11:08.344	0:11:04.4
88	11:03:53.952		0:11:08.352	
89	11:03:59.6	0:37:04	0:11:14.0	0:11:10.10
90	11:04:03.4	0:37:08	0:11:17.8	0:11:14.14
91	11:04:05.162	0:37:10	0:11:19.562	0:11:16.16
92	11:04:05.171		0:11:19.571	
93	11:04:05.569	0:37:10	0:11:19.969	0:11:16.16
94	11:04:05.576		0:11:19.976	
95	11:04:17.8	0:37:22	0:11:32.2	0:11:28.28
96	11:04:18.8	0:37:23	0:11:33.2	0:11:29.29

TABLE 4-10. TEST 6 EVENT TIMES (Continued)

Event Number	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time: TIME CODE** (h:m:s)	Elapsed time: W. D. H.** (h:m:s)
97	11:04:21.971	0:37:27	0:11:36.371	0:11:33.33
98	11:04:21.983		0:11:36.383	
99	11:04:25.4	0:37:30	0:11:39.8	0:11:36.36
100	11:04:34.3	0:37:39	0:11:48.7	0:11:45.45
101	11:04:34.5	0:37:39	0:11:48.9	0:11:45.45
102	11:04:35.5	0:37:40	0:11:49.9	0:11:46.46
103	11:04:40.3	0:37:45	0:11:54.7	0:11:51.51
104	11:04:44.6	0:37:49	0:11:59.0	0:11:55.55
105	11:04:47.8	0:37:52	0:12:02.2	0:11:58.58
106	11:04:48.1	0:37:53	0:12:02.5	0:11:59.59
107	11:04:52.6	0:37:57	0:12:07.0	0:12:03.3
108	11:04:55.2	0:38:00	0:12:09.6	0:12:06.6
109	11:05:00.9	0:38:05	0:12:15.3	0:12:11.11
110	11:05:02.52	0:38:07	0:12:16.92	0:12:13.13
111	11:05:02.89	0:38:08	0:12:17.29	0:12:14.14
112	11:05:03.91	0:38:09	0:12:18.31	0:12:15.15
113	11:05:04.388	0:38:09	0:12:18.738	0:12:15.15
114	11:05:04.399		0:12:18.749	
115	11:05:09.0	0:38:14	0:12:23.4	0:12:20.20
116	11:05:10.2	0:38:15	0:12:24.6	0:12:21.21
117	11:05:20.4	0:38:25	0:12:34.8	0:12:31.31
118	11:05:21.8	0:38:26	0:12:36.2	0:12:32.32
119	11:05:28.1	0:38:33	0:12:42.5	0:12:39.39
120	11:05:31.8	0:38:36	0:12:46.2	0:12:42.42
121	11:05:33.4	0:38:39	0:12:47.8	0:12:45.45
122	11:05:33.6	0:38:39	0:12:48.0	0:12:45.45
123	11:05:40.2	0:38:45	0:12:54.6	0:12:51.51
124	11:05:46.5	0:38:51	0:13:00.9	0:12:57.57
125	11:05:47.7	0:38:52	0:13:02.1	0:12:58.58
126	11:05:50.0	0:38:55	0:13:04.4	0:13:01.1
127	11:05:54.2	0:38:59	0:13:08.6	0:13:05.5
128	11:05:57.68	0:39:02	0:13:12.08	0:13:08.8
129	11:05:57.69	0:39:03	0:13:12.09	0:13:09.9
130	11:05:58.1	0:39:04	0:13:12.5	0:13:10.10
131	11:05:59.0	0:39:04	0:13:13.4	0:13:10.10
132	11:06:02.9	0:39:08	0:13:17.3	0:13:14.14
133	11:06:08.3	0:39:13	0:13:22.7	0:13:19.19
134	11:06:09.9	0:39:14	0:13:24.3	0:13:20.20
135	11:06:16.5	0:39:21	0:13:30.9	0:13:27.27
136	11:06:20.337	0:39:25	0:13:34.737	0:13:31.31
137	11:06:20.344		0:13:34.744	
138	11:06:21.1	0:39:26	0:13:35.5	0:13:32.32
139	11:06:22.9	0:39:28	0:13:37.3	0:13:34.34
140	11:06:28.1	0:39:33	0:13:42.5	0:13:39.39
141	11:06:33.0	0:39:37	0:13:47.4	0:13:43.43
142	11:06:41.2	0:39:46	0:13:55.6	0:13:52.52
143	11:06:41.7	0:39:46	0:13:56.1	0:13:52.52
144	11:06:46.0	0:39:51	0:14:00.4	0:13:57.57

TABLE 4-10. TEST 6 EVENT TIMES (Continued)

Event Number	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time: TIME CODE** (h:m:s)	Elapsed time: W. D. H.** (h:m:s)
145	11:06:48.9	0:39:53	0:14:03.3	0:13:59.59
146	11:06:54.6	0:39:59	0:14:09.0	0:14:05.5
147	11:06:57.0	0:40:02	0:14:11.4	0:14:08.8
148	11:07:00.9	0:40:05	0:14:15.3	0:14:11.11
149	11:07:05.111	0:40:10	0:14:19.511	0:14:16.16
150	11:07:05.119		0:14:19.519	
151	11:07:05.5	0:40:10	0:14:19.9	0:14:16.16
152	11:07:05.7	0:40:10	0:14:20.1	0:14:16.16
153	11:07:10.3	0:40:14	0:14:24.7	0:14:20.20
154	11:07:11.0	0:40:16	0:14:25.4	0:14:22.22
155	11:07:13.1	0:40:18	0:14:27.5	0:14:24.24
156	11:07:17.8	0:40:22	0:14:32.2	0:14:28.28
157	11:07:18.265	0:40:24	0:14:32.670	0:14:30.30
158	11:07:18.270		0:14:32.665	
159	11:07:23.0	0:40:28	0:14:37.4	0:14:34.34
160	11:07:25.1	0:40:30	0:14:39.5	0:14:36.36
161	11:07:26.631	0:40:31	0:14:41.031	0:14:37.37
162	11:07:26.639		0:14:41.039	
163	11:07:34.3	0:40:39	0:14:48.7	0:14:45.45
164	11:07:36.8	0:40:42	0:14:51.2	0:14:48.48
165	11:07:40.1	0:40:45	0:14:54.5	0:14:51.51
166	11:07:42.223	0:40:47	0:14:56.623	0:14:53.53
167	11:07:42.231		0:14:56.631	
168	11:07:43.3	0:40:48	0:14:57.7	0:14:54.54
169	11:07:44.1	0:40:49	0:14:58.5	0:14:55.55
170	11:07:44.5	0:40:49	0:14:58.9	0:14:55.55
171	11:07:46.1	0:40:52	0:15:00.5	0:14:58.58
172	11:07:47.805		0:15:02.205	
173	11:07:47.815		0:15:02.215	
174	11:07:50.4	0:40:55	0:15:04.8	0:15:01.1
175	11:07:58.1	0:41:03	0:15:12.5	0:15:09.9
176	11:08:00.2	0:41:05	0:15:14.6	0:15:11.11
177	11:08:01.4	0:41:06	0:15:15.8	0:15:12.12
178	11:08:03.5	0:41:08	0:15:17.9	0:15:14.14
179	11:08:05.3	0:41:10	0:15:19.7	0:15:16.16
180	11:08:06.3	0:41:11	0:15:20.7	0:15:17.17
181	11:08:14.0	0:41:19	0:15:28.4	0:15:25.25
182	11:08:14.1		0:15:28.5	
183	11:08:20.5	0:41:25	0:15:34.9	0:15:31.31
184	11:08:22.0	0:41:27	0:15:36.4	0:15:33.33
185	11:08:25.5	0:41:30	0:15:39.9	0:15:36.36
186	11:08:25.9	0:41:31	0:15:40.3	0:15:37.37
187	11:08:31.0	0:41:36	0:15:45.4	0:15:42.42
188	11:08:40.7	0:41:45	0:15:55.1	0:15:51.51
189	11:08:42.6	0:41:47	0:15:57.0	0:15:53.53
190	11:08:45.2	0:41:50	0:15:59.6	0:15:56.56
191	11:08:51.3	0:41:56	0:16:05.7	0:16:02.2
192	11:08:52.5	0:41:57	0:16:06.9	0:16:03.3

NSWCDD/TR-93/218

TABLE 4-10. TEST 6 EVENT TIMES (Continued)

Event Number	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time: TIME CODE** (h:m:s)	Elapsed time: W. D. H.** (h:m:s)
193	11:08:53.7	0:41:58	0:16:08.1	0:16:04.4
194	11:08:55.3	0:42:00	0:16:09.7	0:16:06.6
195	11:08:56.1	0:42:01	0:16:10.5	0:16:07.7
196	11:08:58.2	0:42:03	0:16:12.6	0:16:09.9
197	11:09:01.1	0:42:06	0:16:15.6	0:16:12.12
198	11:09:05.0	0:42:09	0:16:19.4	0:16:15.15
199	11:09:11.8	0:42:16	0:16:26.2	0:16:22.22
200	11:09:12.0	0:42:17	0:16:26.4	0:16:23.23
201	11:09:19.5	0:42:25	0:16:33.9	0:16:31.31
202	11:09:21.36	0:42:27	0:16:35.76	0:16:33.33
203	11:09:21.42		0:16:35.82	
204	11:09:25.4	0:42:30	0:16:39.8	0:16:36.36
205	11:09:30.2	0:42:35	0:16:44.6	0:16:41.41
206	11:09:33.40	0:42:38	0:16:47.8	0:16:44.44
207	11:09:33.7	0:42:38	0:16:48.11	0:16:44.44
208	11:09:33.75		0:16:48.15	
209	11:09:36.0	0:42:40	0:16:50.4	0:16:46.46
210	11:09:38.0	0:42:43	0:16:52.4	0:16:49.49
211	11:09:38.6	0:42:43	0:16:53.0	0:16:49.49
212	11:09:40.9	0:42:45	0:16:55.3	0:16:51.51
213	11:10:02.6	0:43:07	0:17:17.0	0:17:13.13
214	11:10:02.9	0:43:08	0:17:17.3	0:17:14.14
215	11:10:03.3	0:43:08	0:17:17.7	0:17:14.14
216	11:10:04.3	0:43:09	0:17:18.7	0:17:15.15
217	11:10:09.5	0:43:14	0:17:23.9	0:17:20.20
218	11:10:09.940	0:43:15	0:17:24.340	0:17:21.21
219	11:10:09.949		0:17:24.349	
220	11:10:10.6	0:43:16	0:17:25.0	0:17:22.22
221	11:10:10.61		0:17:25.01	
222	11:10:20.87	0:43:26	0:17:35.27	0:17:32.32
223	11:10:21.04		0:17:35.44	
224	11:10:23.6	0:43:28	0:17:38.0	0:17:34.34
225	11:10:27.280	0:43:32	0:17:41.680	0:17:38.38
226	11:10:27.288		0:17:41.688	
227	11:10:28.734	0:43:33	0:17:43.134	0:17:39.39
228	11:10:28.740		0:17:43.140	
229	11:10:30.0	0:43:35	0:17:44.4	0:17:41.41
230	11:10:47.7	0:43:52	0:18:02.1	0:17:58.58
231	11:10:50.0	0:43:56	0:18:04.4	0:18:02.2
232	11:10:51.9	0:43:57	0:18:06.3	0:18:03.3
233	11:10:55.375	0:44:00	0:18:09.775	0:18:06.6
234	11:10:55.384		0:18:09.784	
235	11:10:56.6	0:44:01	0:18:11.0	0:18:07.7
236	11:10:58.63	0:44:03	0:18:13.03	0:18:09.9
237	11:10:58.93		0:18:13.33	
238	11:10:59.03		0:18:13.43	
239	11:11:01.8	0:44:06	0:18:15.93	0:18:12.12
240	11:11:02.3	0:44:07	0:18:16.43	0:18:13.13

TABLE 4-10. TEST 6 EVENT TIMES (Continued)

Event Number	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time: TIME CODE** (h:m:s)	Elapsed time: W. D. H.** (h:m:s)
241	11:11:03.2	0:44:08	0:18:17.33	0:18:14.14
242	11:11:05.3	0:44:10	0:18:19.43	0:18:16.16
243	11:11:07.8	0:44:12	0:18:21.93	0:18:18.18
244	11:11:11.0	0:44:15	0:18:25.13	0:18:21.21
245	11:11:12.2	0:44:17	0:18:26.33	0:18:23.23
246	11:11:13.8	0:44:18	0:18:27.93	0:18:24.24
247	11:11:14.86	0:44:19	0:18:28.99	0:18:25.25
248	11:11:14.87	0:44:20	0:18:29.0	0:18:26.26
249	11:11:24.6	0:44:29	0:18:38.73	0:18:35.35
250	11:11:26.1	0:44:31	0:18:40.23	0:18:37.37
251	11:11:27.42	0:44:32	0:18:41.55	0:18:38.38
252	11:11:27.43		0:18:41.56	
253	11:11:30.6	0:44:35	0:18:44.73	0:18:41.41
254	11:11:43.8	0:44:48	0:18:57.93	0:18:54.54
255	11:11:45.3	0:44:50	0:18:59.43	0:18:56.56
256	11:11:50.3	0:44:55	0:19:04.43	0:19:01.1
257	11:11:51.1	0:44:56	0:19:05.23	0:19:02.2
258	11:11:52.9		0:19:07.03	
259	11:11:57.3	0:45:02	0:19:11.43	0:19:08.8
260	11:11:59.6	0:45:04	0:19:13.73	0:19:10.10
261	11:12:03.0	0:45:08	0:19:17.13	0:19:14.14
262	11:12:10.468	0:45:15	0:19:24.868	0:19:21.21
263	11:12:10.472		0:19:24.872	
264	11:12:14.0	0:45:19	0:19:28.13	0:19:25.25
265	11:12:14.9	0:45:20	0:19:29.03	0:19:26.26
266	11:12:15.8	0:45:20	0:19:29.93	0:19:26.26
267	11:12:18.4	0:45:23	0:19:32.53	0:19:29.29
268	11:12:30.8	0:45:35	0:19:44.93	0:19:41.41
269	11:12:40.2	0:45:45	0:19:54.33	0:19:51.51
270	11:12:42.6	0:45:46	0:19:56.73	0:19:52.52
271	11:12:45.2	0:45:50	0:19:59.33	0:19:56.56
272	11:12:54.3	0:45:59	0:20:08.43	0:20:05.5
273	11:13:22.0	0:46:27	0:20:36.0	0:20:33.33
274	11:13:25.4	0:46:30	0:20:39.4	0:20:36.36
275	11:13:33.3	0:46:38	0:20:47.3	0:20:44.44
276	11:13:38.9	0:46:43	0:20:52.9	0:20:49.49
277	11:13:51.1	0:46:56	0:21:05.1	0:21:02.2
278	11:13:54.3	0:46:59	0:21:08.2	0:21:05.5
279	11:14:00.8	0:47:06	0:21:14.7	0:21:12.12
280	11:14:04.11	0:47:10	0:21:18.01	0:21:16.16
281	11:14:04.17	0:47:10	0:21:18.07	0:21:16.16
282	11:14:08.1	0:47:13	0:21:22.22	0:21:19.19
283	11:14:09.2	0:47:14	0:21:23.1	0:21:20.20
284	11:14:09.92	0:47:15	0:21:23.82	0:21:21.21
285	11:14:09.93		0:21:23.83	
286	11:14:23.4	0:47:28	0:21:37.3	0:21:34.34
287	11:14:29.1	0:47:34	0:21:43.0	0:21:40.40
288	11:14:34.2	0:47:39	0:21:48.1	0:21:45.45

TABLE 4-10. TEST 6 EVENT TIMES (Continued)

Event Number	Time Code (h:m:s)	W. D. H EVENT TIME* (h:m:s)	Elapsed time: TIME CODE** (h:m:s)	Elapsed time: W. D. H.** (h:m:s)
289	11:14:57.1	0:48:02	0:22:11.0	0:22:08.8
290	11:15:07.4	0:48:12	0:22:21.3	0:22:18.18
291	11:15:19.7	0:48:24	0:22:33.6	0:22:30.30
292	11:15:38.9	0:48:44	0:22:52.8	0:22:50.50
293	11:15:48.3	0:48:53	0:23:02.2	0:22:59.59
294	11:16:03.9	0:49:09	0:23:17.8	0:23:15.15
295	11:16:05.2	0:49:10	0:23:19.1	0:23:16.16
296	11:16:14.3	0:49:19	0:23:28.2	0:23:25.25
297	11:16:23.69	0:49:28	0:23:37.59	0:23:34.34
298	11:16:23.7	0:49:29	0:23:37.6	0:23:35.35
299	11:16:26.7	0:49:32	0:23:40.6	0:23:38.38
300	11:16:38.1	0:49:44	0:23:52.0	0:23:50.50
301	11:17:06.3	0:50:11	0:24:20.2	0:24:17.17
302	11:17:06.9	0:50:12	0:24:20.8	0:24:18.18
303	11:17:53.2	0:50:58	0:25:07.1	0:25:04.4
304	11:18:05.6	0:51:10	0:25:19.5	0:25:16.16
305	11:18:16.0	0:51:21	0:25:29.9	0:25:27.27
306	11:19:15.8	0:52:21	0:26:29.7	0:26:27.27
307	11:19:25.184	0:52:30	0:26:39.584	0:26:36.36
308	11:19:25.188		0:26:39.588	
309	11:20:14.5	0:53:20	0:27:28.4	0:27:26.26
310	11:20:19.7	0:53:24	0:27:33.6	0:27:30.30
311	11:20:23.5	0:53:29	0:27:37.4	0:27:35.35
312	11:21:00.0	0:54:05	0:28:13.9	0:28:11.11
313	11:21:01.4	0:54:06	0:28:15.3	0:28:12.12
314	11:22:20.0	0:55:25	0:29:33.9	0:29:31.31
315	11:24:01.9	0:57:08	0:31:15.8	0:31:14.14
316	11:24:28.3	0:57:34	0:31:42.2	0:31:40.40
317	11:27:45.0	1:00:43	0:34:58.9	0:34:49.49
318	11:27:52.5	1:00:57	0:35:06.4	0:35:03.3
319	11:29:30.4	1:02:36	0:36:44.3	0:36:42.42
320	11:29:33.3	1:02:42	0:36:47.2	0:36:48.48
321	11:31:40.0	1:04:46	0:38:53.9	0:38:52.52
322	11:38:53.6	1:12:00	0:46:07.5	0:46:06.6
323	11:40:30.4	1:13:36	0:47:44.3	0:47:42.42
324	11:40:31.4	1:13:37	0:47:45.3	0:47:43.43

* referenced to start of fire--W. D. H. is an on-site observer

**measured from the first event

TABLE 4-11. TEST 6 PRESSURE DATA

Event Number	PEAK PRESSURE (psi)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
1	NR	0.07	0.07	0.03	0.09	0.05	0.04	0.01	0.36	0.22	0.09	0.05
2	NR	0.13	0.13	0.06	0.15	0.08	0.05	0.03	0.62	0.44	0.17	0.10
3	NR	0.37	0.30	0.12	1.83	1.05	0.55	0.21	0.85	0.57	0.26	0.13
4	NR	0.15	0.15	0.13	2.80	1.20	0.71	0.24	0.46	0.32	0.17	0.14
5	NR	0.16	0.16	0.07	0.18	0.10	0.08	0.04	0.78	0.47	0.19	0.09
6	NR	0.06	0.05	0.04	0.44	0.24	0.12	0.06	0.39	0.25	0.13	0.07
7	NR	0.03	0.03	0.02	0.43	0.15	0.06	0.03	0.16	0.14	0.07	0.04
8	NR	0.08	0.08	0.04	NR	0.06	0.05	0.02	0.34	0.23	0.10	0.05
9	NR	0.59	0.38	0.18	0.21	0.89	0.45	0.22	0.35	0.30	0.17	0.10
10	NR	0.11	0.11	0.05	0.18	0.14	0.07	0.05	0.66	0.39	0.17	0.10
11	NR	0.06	0.05	0.03	0.10	0.05	0.04	0.03	0.22	0.14	0.08	0.05
12	NR	0.43	0.35	0.20	0.24	1.54	0.80	0.36	0.98	0.72	0.33	0.17
13	NR	0.34	0.22	0.07	NR	0.09	0.07	0.03	0.30	0.22	0.12	0.06
14	NR	0.25	0.27	0.11	0.05	0.15	0.09	0.05	0.89	0.64	0.24	0.11
15	NR	0.28	0.21	0.13	0.08	0.84	0.76	0.33	0.26	0.11	0.07	0.04
16	NR	0.63	0.46	0.15	NR	0.23	0.16	0.09	0.82	0.48	0.21	0.10
17	NR	0.42	0.38	0.15	1.07	0.68	0.51	0.20	0.84	0.57	0.28	0.16
18	NR	0.34	0.27	0.14	1.85	1.30	0.62	0.28	0.20	0.17	0.10	0.07
19	NR	0.13	0.12	0.05	0.10	0.41	0.31	0.16	0.88	0.61	0.24	0.12
20	NR	0.81	0.53	0.22	0.82	0.55	0.37	0.20	1.66	1.09	0.51	0.24
21	NR	0.63	0.38	0.15	1.78	1.23	0.57	0.20	0.26	0.22	0.13	0.08
22	NR	0.56	0.42	0.15	2.60	0.55	0.30	0.10	0.38	0.23	0.09	0.08
23	NR	0.16	0.16	0.07	0.25	0.21	0.12	0.06	0.52	0.38	0.18	0.10
24	NR	0.96	0.57	0.20	1.67	0.75	0.48	0.20	0.51	0.49	0.27	0.12
25	NR	0.50	0.38	0.24	2.50	0.53	0.45	0.27	0.33	0.47	0.27	0.16
26	NR	0.90	0.52	0.19	0.90	0.75	0.32	0.14	0.33	0.25	0.21	0.11
27	NR	0.71	0.41	0.33	1.40	0.85	0.61	0.20	0.34	0.11	0.08	0.04
28	NR	0.60	0.52	0.23	0.80	0.37	0.23	0.12	1.36	0.91	0.43	0.19
29	NR	0.23	0.21	0.11	0.27	0.18	0.14	0.09	0.66	0.17	0.19	0.08
30	NR	0.15	0.15	0.10	0.25	0.15	0.12	0.08	0.44	0.11	0.14	0.06
31	NR	0.16	0.16	0.12	0.45	0.34	0.24	0.12	1.17	0.18	0.28	0.13
32	NR	0.79	0.46	0.17	0.92	0.53	0.33	0.17	0.63	0.11	0.28	0.13
33	NR	0.17	0.20	0.10	0.80	0.84	0.46	0.14	1.07	0.11	0.31	0.14
34	NR	0.51	0.43	0.20	2.27	1.38	0.73	0.21	0.57	0.06	0.22	0.13
35	NR	0.42	0.31	0.18	4.00	2.00	0.95	0.33	0.37	0.04	0.20	0.90
36	NR	0.17	0.17	0.07	0.17	0.15	0.09	0.04	1.26	0.08	0.25	0.10
37	NR	0.42	0.31	0.14	0.35	0.40	0.21	0.08	1.37	0.13	0.38	0.16
38	NR	0.17	0.15	0.08	0.08	0.11	0.06	0.03	0.82	0.07	0.17	0.00
39	NR	0.12	0.12	0.06	0.12	0.15	0.10	0.06	0.73	0.06	0.12	NR
40	NR	0.43	0.35	0.16	1.92	1.51	0.87	0.26	0.32	0.03	0.19	NR
41	NR	0.10	0.09	0.04	0.36	0.35	0.25	0.07	0.46	0.10	0.22	0.11
42	NR	0.59	0.45	0.20	0.47	0.35	0.23	0.14	0.98	0.31	0.32	0.14
43	NR	0.25	0.28	0.15	0.62	0.37	0.28	0.10	0.55	0.24	0.17	0.09
44	NR	0.48	0.37	0.15	0.23	0.16	0.10	0.06	0.57	0.46	0.27	0.13
45	NR	0.22	0.21	0.11	1.85	0.94	0.66	0.28	0.89	0.78	0.31	0.14
46	NR	0.27	0.21	0.10	0.71	0.35	0.14	0.06	0.24	0.18	0.12	0.01
47	NR	0.36	0.35	0.10	0.97	0.53	0.16	0.07	0.28	0.25	0.13	0.09
48	NR	0.44	0.42	0.15	1.45	0.84	0.41	0.28	0.37	0.28	0.17	0.09
49	NR	0.30	0.27	0.15	0.36	0.23	0.16	0.08	0.39	0.27	0.15	0.07
50	NR	0.74	0.47	0.14	0.47	0.29	0.17	0.10	0.49	0.43	0.22	0.12
51	NR	0.52	0.22	0.18	0.72	0.18	0.13	0.13	0.85	0.55	0.26	0.19
52	NR	0.41	0.33	0.15	0.49	0.35	0.20	0.17	0.51	0.36	0.21	0.11
53	NR	0.50	0.30	0.16	0.82	0.20	0.20	0.12	0.50	0.30	0.16	0.09
54	NR	0.24	0.22	0.10	0.39	0.31	0.20	0.15	0.23	0.17	0.10	0.06
55	NR	0.27	0.27	0.12	0.19	0.12	0.09	0.05	1.40	0.83	0.44	0.17
56	NR	0.40	0.31	0.12	3.22	1.08	0.57	0.28	0.21	0.15	0.09	0.05
57	NR	0.30	0.22	0.09	0.46	0.30	0.22	0.12	0.51	0.37	0.19	0.10

TABLE 4-11. TEST 6 PRESSURE DATA (Continued)

Event Number	PEAK PRESSURE (psi)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
53	NR	0.18	0.21	0.09	1.80	1.15	0.68	0.38	0.26	0.19	0.12	0.08
59	NR	0.28	0.27	0.10	0.34	0.25	0.19	0.10	0.91	0.62	0.28	0.13
60	NR	0.51	0.34	0.14	0.28	0.23	0.14	0.06	0.36	0.31	0.20	0.10
61	NR	0.40	0.30	0.31	0.40	0.17	0.12	0.04	0.55	0.31	0.15	0.14
62	NR	0.49	0.31	0.12	1.25	0.87	0.39	0.19	0.33	0.26	0.16	0.11
63	NR	0.78	0.45	0.15	1.10	0.39	0.23	0.13	0.17	0.10	0.06	0.08
64	NR	0.12	0.14	0.08	0.60	0.39	0.24	0.09	0.88	0.52	0.22	0.11
65	NR	0.14	0.16	0.10	0.39	0.52	1.35	0.57	0.10	0.08	0.07	0.11
66	NR	0.31	0.26	0.12	1.96	0.86	0.47	0.46	0.62	0.49	0.20	0.10
67	NR	0.35	0.26	0.11	0.33	0.23	0.18	0.07	1.17	0.80	0.30	0.13
68	NR	0.20	0.21	0.10	0.42	0.29	0.23	0.09	0.39	0.35	0.25	0.09
69	NR	0.33	0.22	0.10	0.84	0.41	0.29	0.18	0.53	0.43	0.27	0.09
70	NR	0.24	0.20	0.10	0.38	0.29	0.20	0.12	0.43	0.33	0.20	0.09
71	NR	0.22	0.18	0.12	1.48	0.85	0.47	0.24	0.51	0.41	0.31	0.13
72	NR	0.24	0.20	0.06	1.00	0.61	0.85	0.18	0.21	0.17	0.12	0.06
73	NR	0.22	0.18	0.10	NR	0.07	0.05	0.03	1.40	0.88	0.47	0.14
74	NR	0.14	0.15	0.08	NR	0.31	0.16	0.09	1.38	0.89	0.52	0.16
75	NR	0.32	0.32	0.15	NR	0.16	0.11	0.07	1.04	0.72	0.40	0.12
76	NR	0.25	0.22	0.12	NR	1.29	0.55	0.17	0.22	0.17	0.13	0.06
77	NR	0.71	0.53	0.23	NR	0.44	0.34	0.16	1.21	1.12	0.72	0.27
78	NR	0.33	0.28	0.13	NR	0.78	0.38	0.20	0.28	0.23	0.22	0.10
79	NR	0.37	0.34	0.17	NR	0.30	0.21	0.08	0.56	0.38	0.25	0.11
80	NR	0.55	0.39	0.15	NR	0.13	0.13	0.08	0.12	0.15	0.13	0.05
81	NR	0.90	0.71	0.31	1.32	1.06	0.50	0.25	0.62	0.43	0.33	0.15
82	NR	0.40	0.38	0.15	0.35	0.24	0.19	0.11	0.56	0.54	0.30	0.14
83	NR	0.16	0.17	0.07	0.18	0.15	0.14	0.09	0.30	0.27	0.17	0.08
84	NR	0.40	0.31	0.14	1.20	1.02	0.70	0.35	0.13	0.10	0.07	0.05
85	NR	0.35	0.26	0.26	1.45	0.90	0.65	0.30	0.22	0.15	0.14	0.11
86	NR	0.11	0.15	0.08	0.27	0.21	0.15	0.09	0.80	0.65	0.36	0.14
87	NR	0.26	0.26	0.10	0.90	0.53	0.35	0.20	0.28	0.11	0.16	0.07
88	NR	0.26	0.20	0.10	1.80	0.85	0.69	0.37	0.29	0.18	0.18	0.08
89	NR	0.20	0.24	0.13	0.35	0.24	0.20	0.12	0.95	0.64	0.42	0.15
90	NR	0.33	0.37	0.18	0.11	0.19	0.13	0.07	1.95	1.11	0.69	0.22
91	NR	0.13	0.14	0.06	0.08	0.14	0.10	0.04	0.30	0.28	0.25	0.09
92	NR	0.13	0.12	0.06	0.10	0.10	0.07	0.02	0.26	0.15	0.15	0.11
93	NR	0.67	0.49	0.15	0.10	0.15	0.13	0.07	0.18	0.19	0.16	0.08
94	NR	0.35	0.28	0.15	0.08	0.14	0.12	0.09	0.25	0.16	0.12	0.11
95	NR	0.10	0.13	0.07	0.91	0.36	0.27	0.11	0.56	0.43	0.37	0.14
96	NR	0.16	0.16	0.10	2.15	1.53	0.56	0.22	0.42	0.47	0.17	0.15
97	NR	0.57	0.38	0.13	0.15	0.09	0.05	0.03	0.29	0.27	0.20	0.13
98	NR	0.25	0.20	0.14	0.16	0.07	0.06	0.03	0.29	0.32	0.28	0.17
99	NR	0.13	0.14	0.08	0.50	0.47	0.30	0.12	0.73	0.58	0.39	0.13
100	NR	0.20	0.21	0.09	0.20	0.12	0.08	0.05	0.52	0.42	0.29	0.12
101	NR	0.19	0.21	0.10	1.17	0.68	0.47	0.28	0.75	0.55	0.43	0.16
102	NR	0.63	0.42	0.13	0.57	0.43	0.31	0.17	0.21	0.20	0.16	0.10
103	NR	0.24	0.25	0.17	2.50	1.46	0.86	0.36	0.75	0.70	0.47	0.17
104	NR	0.31	0.31	0.18	1.51	1.70	0.63	0.24	0.89	0.75	0.50	0.16
105	NR	0.49	0.41	0.20	0.19	0.13	0.10	0.06	0.37	0.34	0.22	0.10
106	NR	0.98	0.60	0.25	0.63	0.39	0.27	0.13	2.05	1.25	0.74	0.23
107	NR	0.33	0.39	0.24	2.13	1.16	0.63	0.31	1.80	1.19	0.70	0.25
108	NR	0.12	0.19	0.11	0.80	0.65	0.29	0.11	0.78	0.59	0.36	0.12
109	NR	0.43	0.42	0.16	0.86	0.69	0.49	0.21	1.39	0.97	0.63	0.21
110	NR	0.20	0.20	0.10	0.87	0.64	0.45	0.23	0.33	0.25	0.18	0.10
111	NR	0.20	0.24	0.12	0.81	0.56	0.44	0.23	0.48	0.36	0.27	0.13
112	NR	0.15	0.16	0.11	0.81	0.52	0.65	0.44	0.66	0.66	0.45	0.17
113	NR	0.11	0.12	0.06	0.15	0.13	0.08	0.05	0.17	0.15	0.11	0.04
114	NR	0.22	0.23	0.04	0.25	0.15	0.11	0.06	0.30	0.20	0.16	0.10

TABLE 4-11. TEST 6 PRESSURE DATA (Continued)

Event Number	PEAK PRESSURE (psi)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
115	NR	0.09	0.12	0.06	0.60	0.36	0.29	0.14	0.81	0.59	0.39	0.13
116	NR	0.58	0.47	0.17	0.38	0.29	0.22	0.11	0.28	0.22	0.20	0.09
117	NR	0.14	0.21	0.14	0.39	0.30	0.28	0.09	1.06	0.77	0.43	0.13
118	NR	0.60	0.61	0.25	0.57	0.59	0.36	0.18	1.02	0.85	0.58	0.20
119	NR	0.82	0.53	0.20	0.34	0.42	0.14	0.09	0.75	0.72	0.35	0.19
120	NR	0.91	0.71	0.25	1.83	1.13	0.85	0.27	1.97	1.41	0.77	0.40
121	NR	0.15	0.18	0.10	1.16	0.72	0.44	0.26	0.85	0.53	0.23	0.14
122	NR	1.13	0.80	0.40	0.93	0.63	0.44	0.23	0.54	0.43	0.25	0.18
123	NR	0.40	0.31	0.14	0.69	0.46	0.25	0.14	0.35	0.27	0.13	0.11
124	NR	0.07	0.09	0.06	0.45	0.66	0.39	0.18	0.61	0.41	0.20	0.10
125	NR	0.14	0.16	0.08	NR	0.11	0.09	0.03	1.37	0.97	0.30	0.14
126	NR	0.57	0.40	0.13	0.18	1.17	0.56	0.19	0.21	0.16	0.10	0.05
127	NR	0.12	0.11	0.06	0.49	0.45	0.27	0.12	0.43	0.40	0.14	0.12
128	NR	0.05	0.05	0.05	0.47	0.45	0.33	0.11	0.47	0.36	0.17	0.10
129	NR	0.06	0.08	0.06	0.63	0.60	0.45	0.22	0.92	0.52	0.29	0.19
130	NR	0.18	0.17	0.08	0.18	0.11	0.09	0.05	0.50	0.39	0.19	0.12
131	NR	0.21	0.20	0.09	0.74	0.87	0.31	0.14	0.12	0.09	0.06	0.04
132	NR	0.19	0.16	0.07	1.22	0.74	0.53	0.23	0.26	0.22	0.10	0.07
133	NR	0.18	0.26	0.11	0.23	0.16	0.11	0.05	1.94	1.07	0.40	0.16
134	NR	0.30	0.30	0.13	0.36	0.25	0.18	0.07	0.65	0.46	0.26	0.12
135	NR	0.15	0.15	0.06	0.10	0.05	0.03	0.02	0.28	0.26	0.14	0.10
136	NR	0.46	0.37	0.15	0.37	0.29	0.24	0.11	0.40	0.34	0.15	0.10
137	NR	0.14	0.14	0.13	0.48	0.13	0.09	0.06	0.55	0.21	0.13	0.12
138	NR	0.36	0.30	0.15	1.60	1.03	0.57	0.22	0.63	0.52	0.24	0.14
139	NR	0.50	0.34	0.14	0.97	0.52	0.58	0.23	0.48	0.43	0.22	0.12
140	NR	0.47	0.36	0.15	0.48	0.36	0.24	0.11	1.10	0.79	0.36	0.18
141	NR	0.77	0.62	0.30	0.85	0.94	0.59	0.20	1.71	1.24	0.56	0.25
142	NR	0.50	0.48	0.22	0.57	0.36	0.21	0.14	1.63	0.93	0.63	0.19
143	NR	0.73	0.53	0.23	0.65	0.76	0.25	0.11	1.34	1.06	0.81	0.30
144	NR	0.17	0.18	0.09	0.28	0.21	0.12	0.06	0.50	0.33	0.21	0.11
145	NR	0.05	0.07	0.01	0.25	0.14	0.09	0.06	1.01	0.86	0.42	0.14
146	NR	0.61	0.48	0.18	0.27	0.20	0.15	0.06	1.12	0.86	0.46	0.17
147	NR	0.44	0.34	0.13	1.00	0.72	0.57	0.27	0.31	0.20	0.16	0.08
148	NR	0.30	0.29	0.10	1.38	0.89	0.50	0.19	0.29	0.26	0.16	0.09
149	NR	0.18	0.17	0.08	0.21	0.13	0.09	0.05	0.31	0.24	0.16	0.08
150	NR	0.07	0.08	0.09	0.25	0.10	0.07	0.04	0.25	0.15	0.19	0.10
151	NR	0.20	0.16	0.08	0.31	0.19	0.11	0.07	0.64	0.43	0.26	0.10
152	NR	0.67	0.64	0.36	3.47	2.38	0.92	0.35	0.87	0.61	0.38	0.20
153	NR	0.41	0.36	0.15	1.61	1.49	0.72	0.22	0.25	0.20	0.18	0.10
154	NR	0.47	0.39	0.13	0.37	0.24	0.16	0.08	0.26	0.24	0.20	0.11
155	NR	0.44	0.29	0.12	1.20	0.83	0.43	0.19	0.27	0.22	0.16	0.07
156	NR	0.22	0.21	0.08	0.25	0.14	0.09	0.04	0.23	0.19	0.14	0.08
157	NR	0.15	0.18	0.07	0.22	0.14	0.10	0.05	0.82	0.53	0.33	0.14
158	NR	0.13	0.16	0.07	0.20	0.12	0.09	0.04	0.50	0.10	0.10	0.07
159	NR	0.23	0.30	0.10	1.18	0.69	0.48	0.22	0.39	0.35	0.23	0.10
160	NR	0.30	0.33	0.15	2.63	1.33	0.89	0.41	0.71	0.68	0.51	0.20
161	NR	0.16	0.18	0.10	1.40	0.74	0.41	0.29	0.28	0.25	0.18	0.08
162	NR	0.11	0.17	0.05	1.40	0.70	0.69	0.29	0.37	0.28	0.27	0.22
163	NR	0.29	0.21	0.08	1.92	1.10	0.78	0.29	0.73	0.56	0.38	0.16
164	NR	0.23	0.27	0.15	1.59	0.72	0.34	0.18	1.24	0.83	0.56	0.19
165	NR	0.42	0.36	0.15	0.54	0.24	0.18	0.10	0.43	0.32	0.23	0.10
166	NR	0.38	0.33	0.14	0.56	0.39	0.24	0.12	0.18	0.15	0.11	0.06
167	NR	0.37	0.32	0.11	0.43	0.15	0.14	0.04	0.14	0.10	0.10	0.06
168	NR	0.55	0.55	0.20	0.38	0.30	0.22	0.16	3.03	1.65	0.89	0.25
169	NR	0.60	0.52	0.20	1.01	1.00	0.60	0.26	1.07	0.79	0.56	0.24
170	NR	0.54	0.33	0.08	0.17	0.25	0.15	0.07	0.23	0.22	0.18	0.11
171	NR	0.32	0.25	0.06	0.89	0.33	0.15	0.08	0.32	0.28	0.21	0.09

TABLE 4-11. TEST 6 PRESSURE DATA (Continued)

Event Number	PEAK PRESSURE (psi)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
172	NR	0.07	0.05	0.04	0.25	0.17	0.12	0.05	0.17	0.14	0.10	0.05
173	NR	0.09	0.07	0.06	0.23	0.10	0.06	0.03	0.29	0.21	0.13	0.05
174	NR	0.10	0.13	0.05	0.18	0.10	0.06	0.03	1.13	0.68	0.43	0.12
175	NR	0.60	0.55	0.25	0.69	0.55	0.34	0.14	1.50	1.14	0.75	0.25
176	NR	0.51	0.60	0.20	1.28	1.21	1.17	0.46	0.73	0.50	0.34	0.14
177	NR	0.32	0.27	0.17	0.38	0.27	0.18	0.09	0.61	0.46	0.26	0.11
178	NR	0.21	0.22	0.10	0.18	0.12	0.08	0.05	0.47	0.35	0.24	0.10
179	NR	0.17	0.20	0.12	1.96	0.89	0.46	0.19	0.29	0.30	0.22	0.10
180	NR	0.18	0.20	0.10	1.73	0.78	0.57	0.16	0.55	0.43	0.29	0.10
181	NR	0.05	0.10	0.01	0.91	0.51	0.33	0.27	0.74	0.48	0.25	0.08
182	NR	0.57	0.37	0.04	0.56	0.29	0.19	0.07	0.12	0.11	0.08	0.08
183	NR	0.19	0.22	0.09	0.29	0.23	0.12	0.06	0.96	0.74	0.48	0.16
184	NR	1.07	0.74	0.23	0.32	0.20	0.15	0.07	0.71	0.70	0.41	0.20
185	NR	0.22	0.22	0.11	0.30	0.19	0.11	0.05	1.00	0.66	0.47	0.16
186	NR	0.73	0.46	0.15	1.10	0.83	0.62	0.27	0.16	0.13	0.09	0.05
187	NR	0.68	0.47	0.14	0.53	0.30	0.21	0.11	0.55	0.48	0.34	0.17
188	NR	0.46	0.42	0.18	0.61	0.44	0.37	0.20	3.37	1.70	0.93	0.26
189	NR	0.51	0.38	0.14	0.62	0.45	0.39	0.22	0.36	0.32	0.21	0.10
190	NR	0.19	0.18	0.07	0.15	0.11	0.06	0.03	0.29	0.19	0.14	0.05
191	NR	0.22	0.22	0.08	0.71	0.34	0.34	0.14	0.84	0.56	0.37	0.13
192	NR	1.16	0.82	0.40	1.24	0.70	0.56	0.32	0.67	0.61	0.47	0.23
193	NR	0.35	0.36	0.16	0.48	0.37	0.27	0.17	1.34	0.95	0.62	0.20
194	NR	0.48	0.43	0.20	1.86	0.99	0.75	0.39	0.62	0.43	0.30	0.16
195	NR	0.32	0.30	0.12	0.13	0.12	0.13	0.08	2.95	1.68	0.84	0.23
196	NR	0.28	0.27	0.10	0.98	0.58	0.44	0.20	0.17	0.15	0.11	0.05
197	NR	0.45	0.39	0.16	0.20	0.16	0.13	0.07	1.50	0.82	0.52	0.17
198	NR	0.62	0.47	0.20	0.26	0.18	0.13	0.08	0.64	0.59	0.39	0.13
199	NR	1.41	0.83	0.22	0.73	0.46	0.30	0.20	1.27	0.65	0.45	0.18
200	NR	0.52	0.44	0.20	0.62	0.29	0.23	0.10	1.27	0.86	0.62	0.21
201	NR	0.16	0.17	0.07	0.51	0.38	0.24	0.10	0.77	0.52	0.33	0.12
202	NR	0.12	0.16	0.10	2.31	0.96	0.43	0.20	0.98	0.65	0.44	0.16
203	NR	0.60	0.42	0.10	1.21	0.99	0.52	0.23	0.48	0.26	0.20	0.18
204	NR	0.99	0.73	0.24	0.25	0.17	0.14	0.06	1.00	0.79	0.44	0.17
205	NR	0.44	0.34	0.14	1.54	1.01	0.69	0.21	0.47	0.34	0.25	0.11
206	NR	0.70	0.47	0.17	0.99	0.60	0.33	0.18	0.35	0.23	0.17	0.10
207	NR	0.31	0.40	0.23	0.43	0.27	0.20	0.11	1.23	0.86	0.51	0.19
208	NR	0.68	0.51	0.23	0.40	0.20	0.14	0.08	1.06	0.65	0.32	0.12
209	NR	0.10	0.13	0.07	0.35	0.60	0.33	0.14	0.69	0.50	0.30	0.14
210	NR	0.88	0.58	0.24	2.32	1.23	0.62	0.30	0.66	0.94	0.47	0.25
211	NR	1.27	0.89	0.25	0.44	0.28	0.22	0.15	1.19	0.88	0.48	0.20
212	NR	0.17	0.29	0.17	1.94	1.11	0.61	0.22	1.33	0.97	0.58	0.24
213	NR	0.58	0.48	0.17	0.55	0.46	0.30	0.14	0.70	0.55	0.39	0.20
214	NR	0.50	0.32	0.12	1.82	1.12	0.67	0.28	1.41	0.90	0.51	0.19
215	NR	0.45	0.32	0.11	1.12	0.52	0.29	0.13	0.49	0.40	0.30	0.13
216	NR	1.13	0.72	0.22	0.98	1.12	0.91	0.42	1.06	0.89	0.51	0.29
217	NR	0.72	0.58	0.21	0.67	0.36	0.24	0.14	0.95	0.86	0.57	0.19
218	NR	0.49	0.39	0.19	0.52	0.24	0.17	0.09	0.65	0.52	0.36	0.12
219	NR	0.29	0.17	0.29	0.55	0.16	0.18	0.14	0.40	0.27	0.29	0.11
220	NR	0.46	0.40	0.13	0.46	0.24	0.17	0.09	0.34	0.26	0.19	0.08
221	NR	0.48	0.38	0.13	0.48	0.27	0.19	0.11	0.42	0.25	0.16	0.10
222	NR	0.59	0.49	0.17	NR	2.90	1.28	0.35	0.30	0.29	0.24	0.15
223	NR	0.97	0.78	0.27	1.45	0.60	0.41	0.15	1.32	1.14	0.74	0.25
224	NR	0.45	0.29	0.10	0.20	0.17	0.14	0.07	0.17	0.16	0.11	0.06
225	NR	0.24	0.30	0.13	2.53	1.23	0.46	0.20	0.52	0.50	0.24	0.11
226	NR	0.10	0.12	0.13	2.00	1.20	0.64	0.25	0.62	0.30	0.25	0.14
227	NR	0.56	0.39	0.13	0.18	0.12	0.09	0.06	0.60	0.53	0.30	0.15
228	NR	0.42	0.34	0.13	0.19	0.07	0.06	0.04	0.57	0.26	0.23	0.13

TABLE 4-11. TEST 6 PRESSURE DATA (Continued)

Event Number	PEAK PRESSURE (psi)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
229	NR	0.29	0.29	0.17	1.23	0.88	0.74	0.31	2.95	1.62	0.92	0.28
230	NR	0.65	0.56	0.17	0.47	0.42	0.22	0.09	0.45	0.41	0.29	0.10
231	NR	0.53	0.45	0.15	3.31	1.17	0.67	0.22	0.48	0.40	0.30	0.15
232	NR	0.22	0.20	0.09	0.28	0.19	0.11	0.05	0.55	0.48	0.35	0.10
233	NR	0.09	0.13	0.07	0.52	0.40	0.29	0.18	1.07	1.00	0.68	0.28
234	NR	NR	NR	NR	1.10	0.37	0.20	0.15	1.36	0.87	0.60	0.27
235	NR	0.31	0.34	0.18	1.46	0.80	0.50	0.25	1.01	0.87	0.44	0.16
236	NR	0.48	0.42	0.17	1.04	0.65	0.45	0.19	0.44	0.41	0.26	0.12
237	NR	0.74	0.75	0.29	0.95	0.44	0.36	0.24	0.43	0.38	0.28	0.15
238	NR	0.40	0.18	0.29	0.72	0.31	0.31	0.10	0.26	0.24	0.19	0.10
239	NR	0.95	0.59	0.20	1.23	0.60	0.42	0.22	0.40	0.30	0.22	0.12
240	NR	0.98	0.62	0.20	2.25	1.07	0.54	0.27	1.02	0.74	0.49	0.17
241	NR	0.20	0.16	0.07	0.48	0.33	0.18	0.08	0.29	0.32	0.17	0.09
242	NR	0.86	0.63	0.23	2.05	1.22	0.82	0.33	0.78	0.69	0.45	0.17
243	NR	0.36	0.31	0.15	0.27	0.13	0.08	0.05	0.72	0.51	0.36	0.10
244	NR	0.26	0.25	0.12	0.32	0.15	0.09	0.05	1.12	0.84	0.47	0.14
245	NR	1.11	0.75	0.20	0.68	0.51	0.35	0.10	0.77	0.79	0.51	0.25
246	NR	0.15	0.15	0.07	0.25	0.21	0.15	0.08	0.40	0.34	0.21	0.10
247	NR	0.40	0.31	0.13	0.63	0.26	0.23	0.10	0.50	0.46	0.30	0.14
248	NR	0.75	0.51	0.11	0.63	0.29	0.22	0.14	0.46	0.30	0.26	0.15
249	NR	0.79	0.55	0.18	2.30	1.49	0.73	0.21	0.55	0.40	0.33	0.16
250	NR	0.46	0.38	0.20	0.59	0.39	0.28	0.18	2.40	1.34	0.74	0.24
251	NR	0.35	0.31	0.10	2.09	1.02	0.35	0.17	0.33	0.30	0.17	0.08
252	NR	0.11	0.15	0.08	0.60	0.40	0.20	0.12	0.21	0.24	0.21	0.10
253	NR	0.45	0.40	0.22	1.12	0.76	0.57	0.30	2.23	1.40	0.88	0.32
254	NR	0.27	0.28	0.12	0.76	0.54	0.41	0.22	2.08	1.16	0.75	0.21
255	NR	1.11	0.75	0.22	1.64	1.07	0.56	0.29	0.71	0.67	0.53	0.20
256	NR	0.45	0.43	0.20	2.19	1.21	0.75	0.26	0.83	0.74	0.52	0.22
257	NR	0.49	0.38	0.17	0.32	0.21	0.15	0.07	0.96	0.70	0.48	0.14
258	NR	0.16	0.11	0.05	0.12	0.09	0.07	0.03	0.06	0.04	0.03	0.02
259	NR	0.41	0.40	0.15	1.95	1.31	0.72	0.35	1.16	0.82	0.51	0.19
260	NR	1.25	0.76	0.22	1.23	0.84	0.52	0.24	0.37	0.27	0.22	0.12
261	NR	0.45	0.37	0.13	1.62	1.15	0.53	0.22	0.23	0.21	0.13	0.07
262	NR	0.23	0.23	0.10	0.31	0.36	0.19	0.10	0.52	0.40	0.24	0.09
263	NR	0.17	0.14	0.10	NR	0.18	0.05	0.02	0.40	0.20	0.10	0.08
264	NR	0.59	0.42	0.15	1.18	0.69	0.36	0.20	0.50	0.35	0.29	0.12
265	NR	0.31	0.30	0.11	0.92	0.60	0.33	0.16	0.89	0.64	0.43	0.16
266	NR	0.63	0.49	0.16	0.74	0.54	0.38	0.19	0.60	0.53	0.39	0.14
267	NR	0.95	0.77	0.29	1.15	0.69	0.48	0.22	2.09	1.54	0.94	0.26
268	NR	0.84	0.56	0.19	3.60	1.47	0.68	0.27	0.24	0.26	0.19	0.10
269	NR	0.81	0.61	0.18	0.74	0.45	0.30	0.16	0.69	0.65	0.43	0.16
270	NR	0.18	0.18	0.06	1.18	0.69	0.38	0.19	0.61	0.53	0.34	0.11
271	NR	0.77	0.55	0.21	0.59	0.38	0.27	0.15	1.15	0.83	0.53	0.18
272	NR	0.97	0.73	0.28	0.49	0.37	0.26	0.15	2.77	1.81	0.65	0.30
273	NR	0.69	0.53	0.23	0.75	0.58	0.39	0.17	1.69	1.17	0.65	0.21
274	NR	0.43	0.34	0.13	1.03	0.80	0.42	0.16	0.55	0.48	0.51	0.13
275	NR	0.94	0.64	0.29	1.57	1.03	0.52	0.22	0.94	0.79	0.46	0.19
276	NR	1.07	0.88	0.26	0.80	0.53	0.30	0.18	1.16	0.86	0.55	0.18
277	NR	0.91	0.64	0.16	1.06	0.56	0.37	0.16	0.56	0.56	0.41	0.17
278	NR	0.51	0.46	0.20	1.86	0.93	0.54	0.23	1.41	0.94	0.77	0.20
279	NR	0.22	0.17	0.08	0.26	0.18	0.13	0.06	0.63	0.48	0.30	0.13
280	NR	0.41	0.32	0.12	0.30	0.07	0.05	0.03	0.90	0.69	0.40	0.14
281	NR	0.99	0.60	0.10	1.99	1.03	0.58	0.30	0.27	0.19	0.16	0.13
282	NR	0.04	0.04	0.01	0.16	0.09	0.06	0.03	0.06	0.04	0.03	0.01
283	NR	0.62	0.49	0.19	1.06	0.81	0.37	0.20	1.21	0.96	0.56	0.19
284	NR	0.18	0.16	0.07	0.59	0.41	0.30	0.12	0.40	0.34	0.20	0.10
285	NR	0.10	0.14	0.07	0.52	0.17	0.13	0.05	0.36	0.25	0.17	0.12

TABLE 4-11. TEST 6 PRESSURE DATA (Continued)

Event Number	PEAK PRESSURE (psi)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
286	NR	0.98	0.68	0.23	0.51	0.44	0.37	0.16	1.19	0.89	0.56	0.19
287	NR	0.51	0.38	0.17	0.63	0.44	0.31	0.16	0.57	0.47	0.26	0.12
288	NR	0.85	0.61	0.21	1.22	0.78	0.32	0.18	1.20	0.88	0.51	0.20
289	NR	0.48	0.41	0.18	0.41	0.38	0.35	0.23	NR	3.14	1.20	0.31
290	NR	0.39	0.33	0.14	2.18	0.89	0.56	0.31	0.73	0.59	0.41	0.14
291	NR	0.92	0.65	0.24	0.71	0.67	0.47	0.24	1.10	0.87	0.82	0.16
292	NR	0.92	0.62	0.22	1.74	0.84	0.51	0.22	0.87	0.82	0.57	0.19
293	NR	0.65	0.53	0.16	1.52	0.62	0.43	0.17	1.05	0.83	0.54	0.21
294	NR	0.51	0.42	0.22	0.73	0.51	0.31	0.16	2.04	1.20	0.65	0.18
295	NR	0.31	0.29	0.24	0.17	0.11	0.07	0.03	1.00	0.73	0.36	0.13
296	NR	1.09	0.75	0.22	1.52	1.13	0.65	0.31	0.88	0.82	0.55	0.19
297	NR	0.93	0.63	0.20	0.56	0.35	0.27	0.12	0.93	0.78	0.43	0.17
298	NR	0.30	0.30	0.21	0.53	0.25	0.20	0.15	1.12	0.61	0.45	0.25
299	NR	0.62	0.45	0.17	3.24	1.35	0.83	0.32	0.56	0.48	0.34	0.18
300	NR	0.88	0.59	0.21	1.16	0.66	0.42	0.22	1.21	0.87	0.56	0.20
301	NR	0.74	0.50	0.15	1.33	0.76	0.45	0.19	0.83	0.70	0.46	0.17
302	NR	0.43	0.37	0.18	2.12	1.07	0.66	0.36	2.03	1.30	0.77	0.22
303	NR	0.88	0.64	0.21	1.27	1.05	0.47	0.17	1.64	1.09	0.59	0.23
304	NR	0.71	0.56	0.22	1.05	0.52	0.35	0.17	1.65	1.10	0.65	0.18
305	NR	1.40	0.89	0.25	1.98	1.10	0.71	0.34	1.27	0.98	0.60	0.22
306	NR	1.30	0.80	0.21	1.00	0.65	0.48	0.27	0.85	0.70	0.53	0.20
307	NR	0.49	0.39	0.16	1.18	0.65	0.45	0.29	1.26	0.79	0.41	0.14
308	NR	0.22	0.20	0.16	NR	NR	NR	NR	1.50	0.61	0.47	0.17
309	NR	1.42	0.84	0.18	0.89	0.80	0.52	0.22	0.93	0.44	0.27	0.13
310	NR	0.32	0.29	0.12	1.31	0.64	0.39	0.21	0.80	0.52	0.30	0.11
311	NR	0.66	0.53	0.22	0.60	0.45	0.28	0.14	2.29	1.22	0.60	0.21
312	NR	0.69	0.55	0.21	1.71	0.96	0.57	0.22	1.73	0.82	0.49	0.18
313	NR	1.25	0.81	0.23	1.48	1.01	0.53	0.30	1.68	1.09	0.71	0.24
314	NR	0.68	0.48	0.17	0.74	0.47	0.35	0.16	0.90	0.70	0.38	0.16
315	NR	0.79	0.50	0.20	3.06	1.20	0.68	0.26	0.81	0.64	0.45	0.19
316	NR	0.68	0.51	0.19	0.33	0.27	0.22	0.13	1.69	1.07	0.61	0.19
317	NR	1.02	0.68	0.23	0.80	0.60	0.40	0.26	1.04	0.79	0.50	0.20
318	NR	0.87	0.63	0.25	1.07	0.66	0.46	0.20	1.80	1.18	0.70	0.20
319	NR	0.82	0.61	0.23	1.44	0.89	0.57	0.26	2.44	1.64	0.93	0.27
320	NR	0.73	0.57	0.19	1.73	0.98	0.55	0.25	1.36	0.88	0.58	0.19
321	NR	0.83	0.64	0.23	0.90	0.58	0.46	0.27	2.20	1.24	0.68	0.22
322	NR	0.97	0.67	0.20	2.53	1.28	0.76	0.28	0.92	0.70	0.50	0.22
323	NR	1.08	0.77	0.23	1.57	1.04	0.65	0.27	0.94	0.74	0.49	0.17
324	NR	1.24	0.87	0.25	2.31	1.17	0.67	0.24	1.15	0.94	0.62	0.20

NR: no useable record

TABLE 4-12. TEST 6 TIME OF ARRIVAL DATA

EVENT NUMBER	TIME OF ARRIVAL (ms)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
1	32.40	45.50	72.50	162.2	29.90	47.10	72.80	162.2	29.30	47.10	73.50	163.5
2	34.56	50.93	77.70	167.0	37.80	54.41	79.59	165.4	34.18	51.79	78.38	167.3
3	37.40	54.44	80.81	169.8	29.81	46.60	72.00	160.0	39.08	56.41	82.87	165.4
4					No separate zero time							
5	33.52	49.63	75.83	166.6	34.01	50.09	74.50	165.4	28.29	45.91	72.50	161.6
6	31.80	49.20	76.08	158.4	24.06	40.64	65.51	152.7	28.45	46.15	72.99	162.2
7	32.18	49.08	75.05	159.0	22.30	36.83	62.26	149.2	31.71	49.28	76.87	165.4
8	25.71	40.39	66.59	156.5	27.46	42.18	66.78	154.0	25.35	43.13	69.89	159.0
9	32.08	49.46	75.55	165.4	26.70	42.66	66.41	153.0	42.63	60.56	87.31	177.5
10	35.85	51.89	77.56	167.3	31.20	48.63	74.42	160.9	25.95	43.63	70.38	159.6
11	35.00	51.50	77.60	168.6	32.04	49.19	76.30	164.7	28.60	45.80	73.10	162.2
12	36.25	53.96	79.29	169.2	25.98	42.35	67.17	154.5	34.76	52.52	79.66	169.2
13	28.23	45.89	72.42	162.2	NR	46.28	71.18	158.4	32.12	49.80	77.33	166.6
14	34.30	51.14	77.50	167.3	NR	53.08	78.22	165.4	33.46	51.04	77.55	166.6
15	30.60	48.40	74.50	177.0	23.60	40.20	65.60	151.9	42.10	62.40	91.10	172.9
16	33.49	50.50	76.06	164.7	40.10	57.04	81.92	169.2	33.03	50.14	76.29	165.4
17	31.02	48.72	75.06	165.4	33.12	47.97	71.48	162.2	33.99	51.78	78.22	167.3
18	31.69	49.47	75.64	164.7	25.87	42.73	67.65	155.2	40.65	58.71	85.49	174.9
19	31.78	48.79	75.49	165.4	22.80	39.01	64.20	152.7	24.02	41.38	68.40	157.1
20	31.72	49.14	75.08	164.1	35.75	52.12	76.82	164.7	32.77	49.18	75.80	164.7
21	32.14	49.54	75.75	164.7	27.40	44.03	67.87	155.3	42.00	60.13	87.36	176.2
22					No separate zero time							
23	33.39	50.94	77.13	167.9	27.42	44.91	70.64	159.0	27.85	45.62	72.40	161.6
24	35.75	52.97	78.93	167.9	26.62	44.16	69.44	157.7	38.94	56.68	83.82	173.0
25					No separate zero time							
26	25.54	42.64	68.65	157.7	31.20	48.07	73.10	161.2	44.83	62.75	89.70	179.4
27					No separate zero time							
28	31.79	49.51	75.89	164.7	35.81	53.04	78.90	167.9	32.40	49.77	76.30	164.7
29	31.80	48.94	75.56	166.0	31.80	49.28	75.60	164.7	27.90	45.58	72.31	162.2
30	32.50	49.75	76.44	166.0	33.10	50.50	76.67	165.4	26.81	44.86	71.75	160.9
31	32.80	49.24	75.71	166.0	30.56	48.01	73.30	162.2	15.90	33.50	60.01	147.9
32	25.15	42.50	68.55	159.0	34.00	51.02	76.27	165.0	40.45	58.89	85.30	174.9
33	NR	45.88	70.17	159.0	21.00	38.31	63.20	149.9	23.33	40.66	67.07	155.8
34	NR	52.00	78.20	166.6	22.56	37.50	62.53	150.7	40.64	58.77	85.43	174.9
35					No separate zero time							
36	39.38	55.76	82.03	171.7	38.60	55.51	81.03	168.6	28.06	45.49	55.86	161.6
37	31.90	49.65	76.08	165.0	33.10	50.51	75.56	163.5	32.17	49.53	75.86	165.0
38	28.19	44.85	71.62	159.6	28.60	45.80	71.20	159.0	24.95	42.80	69.48	
39					No separate zero time							
40	30.26	47.70	73.90	162.8	27.21	44.31	69.30	156.5	41.17	62.16	86.06	175.5
41	27.77	45.15	71.24	159.6	36.30	53.40	79.91	167.9	40.10	58.03	84.69	173.6
42	31.89	48.96	75.01	164.0	38.63	56.03	81.55	169.2	33.66	50.80	76.90	166.0
43	34.82	52.19	78.65	178.0	33.43	50.24	74.12	162.0	34.00	51.93	78.75	168.6
44	25.79	42.97	68.92	158.4	35.75	51.67	75.66	162.0	40.19	57.80	84.68	173.6
45	37.40	52.75	79.50	169.0	29.74	46.90	72.32	159.6	35.28	52.71	79.09	168.6
46	25.40	43.04	69.57	158.4	32.00	47.13	71.94	157.8	40.70	58.75	86.02	174.9
47	24.50	39.36	68.38	159.0	33.00	46.87	71.32	155.8	41.75	63.85	87.14	180.0
48	27.90	45.07	71.20	160.0	24.54	42.45	67.71	155.5	41.87	59.93	87.34	176.0
49	29.14	46.53	72.90	162.0	31.49	46.81	69.58	157.0	29.30	47.27	74.06	164.0
50	33.46	50.19	76.56	166.0	30.90	47.94	72.63	160.0	39.19	56.84	84.36	174.0
51					No separate zero time							
52	29.55	47.06	73.10	162.0	33.10	49.96	75.10	165.0	36.62	54.61	81.40	169.8
53					No separate zero time							
54	27.66	44.90	71.57	161.0	32.76	50.08	75.41	163.0	39.00	56.76	84.02	174.0
55	40.04	56.80	83.31	173.0	43.30	60.23	85.90	171.7	27.03	44.05	70.14	159.0
56	32.31	49.34	75.56	165.0	24.29	40.90	66.11	154.0	42.15	59.63	87.00	176.0
57	30.79	48.28	74.71	164.5	32.51	48.27	73.21	159.0	35.72	53.59	80.29	171.0

TABLE 4-12. TEST 6 TIME OF ARRIVAL DATA (Continued)

EVENT NUMBER	TIME OF ARRIVAL (ms)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
58	30.92	48.49	75.00	165.0	25.44	42.58	67.76	155.0	36.90	55.30	81.28	171.0
59	30.54	48.00	74.46	164.0	34.69	52.30	77.49	166.0	35.05	52.51	78.94	168.0
60	26.50	44.11	70.41	159.5	32.40	49.41	74.85	162.0	40.78	58.42	85.41	175.0
61					No separate zero time							
62	22.19	40.10	65.79	156.0	31.74	47.67	72.28	159.0	43.70	61.32	88.34	178.0
63					No separate zero time							
64	27.51	44.59	71.20	159.0	24.95	40.10	64.72	152.7	17.20	34.43	61.05	151.0
65	99.20	104.30	117.70	181.9	57.39	40.99	21.00	67.4	131.00	146.30	173.60	262.0
66	32.17	49.48	76.18	165.0	25.65	42.89	68.15	156.0	24.07	42.00	68.03	157.5
67	30.72	48.09	75.00	165.0	35.87	53.14	78.03	167.0	31.72	49.15	75.10	165.0
68	30.95	48.50	74.96	165.0	36.08	53.21	78.20	167.0	36.04	53.91	81.06	171.0
69	33.65	50.94	77.51	167.0	26.19	43.55	69.18	157.5	35.16	52.99	79.85	169.5
70	25.24	42.80	69.06	157.0	24.80	48.40	74.56	163.0	29.60	47.70	73.80	162.8
71	8.90	26.10	52.70	140.6	3.20	20.30	45.00	132.9	10.20	28.00	54.70	144.4
72	29.43	46.40	72.50	162.2	22.30	37.75	62.25	148.0	42.83	60.67	88.00	175.5
73	37.96	54.76	81.44	171.0	NR	54.10	82.13	165.0	28.36	45.24	71.65	161.0
74	29.98	47.53	73.58	162.0	NR	45.00	69.92	159.0	21.92	36.55	62.96	152.5
75	39.97	57.83	83.92	173.0	NR	62.00	86.36	174.0	22.87	39.43	65.18	153.9
76	31.30	48.50	74.44	163.5	NR	38.35	63.38	150.7	39.59	57.48	84.45	174.0
77	28.67	45.84	71.90	161.0	NR	47.50	72.91	159.0	34.37	51.70	77.55	167.5
78	26.02	42.58	69.27	159.0	NR	42.19	67.74	156.0	40.90	59.06	85.76	175.0
79	25.22	42.45	68.94	157.5	NR	50.20	75.70	163.0	39.99	58.18	84.42	174.0
80	21.38	38.75	64.88	154.0	NR	50.90	76.46	164.0	45.80	63.96	90.61	180.0
81	24.68	41.93	66.81	156.5	30.80	47.66	72.89	162.0	43.65	61.12	88.22	178.0
82	29.30	46.10	73.10	162.0	31.91	48.91	75.10	163.0	37.24	55.05	81.61	171.0
83	29.73	47.53	73.80	165.0	32.21	49.39	75.00	163.0	32.60	50.39	77.27	167.0
84	25.18	42.50	69.02	159.0	24.40	41.34	66.41	154.0	43.90	62.47	89.17	178.0
85					No separate zero time							
86	30.44	48.48	75.70	163.0	27.59	43.93	68.41	156.0	27.10	44.66	71.19	161.0
87	29.41	46.21	73.10	162.0	17.80	34.70	59.80	148.0	42.19	60.51	86.95	177.0
88					No separate zero time							
89	33.10	49.79	75.47	165.0	23.17	39.96	65.49	154.5	24.72	42.04	68.33	157.5
90	36.41	53.83	79.59	171.0	35.53	52.04	76.54	165.0	26.27	43.30	69.48	158.0
91	30.50	48.91	75.26	165.0	34.30	50.45	74.36	163.0	33.10	50.28	77.48	167.0
92					No separate zero time							
93	22.05	37.95	64.29	153.0	36.90	52.57	77.73	165.0	45.20	63.00	89.67	180.0
94					No separate zero time							
95	40.10	57.91	83.41	165.0	28.29	44.87	69.96	158.0	33.04	50.47	77.27	166.5
96	35.30	52.35	78.41	169.0	22.96	38.97	61.55	151.0	36.90	54.10	80.10	170.0
97	24.83	41.95	68.34	157.0	35.00	51.37	76.32	162.0	41.99	59.51	86.30	176.0
98					No separate zero time							
99	33.73	51.32	78.05	168.0	32.49	48.84	73.80	161.0	31.72	49.58	75.96	165.0
100	33.59	51.06	77.64	168.0	34.44	51.51	77.19	162.0	33.85	51.65	78.13	167.0
101	37.05	54.02	80.12	170.5	22.58	39.19	64.44	153.0	37.85	55.08	81.83	171.1
102	22.30	39.65	65.84	156.0	32.40	49.40	74.84	162.2	47.64	64.59	91.66	177.9
103	29.86	47.09	73.41	163.0	15.30	31.20	55.74	141.8	24.47	41.11	66.88	156.0
104	33.70	51.33	77.67	167.3	21.00	37.63	63.00	150.3	29.09	46.35	72.41	160.9
105	27.64	44.99	71.42	160.9	37.29	54.16	80.09	167.9	40.17	57.80	84.72	174.3
106	34.33	51.68	77.77	167.0	37.17	54.42	80.15	168.5	26.54	43.39	69.35	158.4
107	30.75	47.74	74.25	165.0	31.53	48.14	73.50	161.5	30.11	47.25	73.41	162.0
108	37.23	54.66	81.02	171.1	34.05	50.74	76.16	165.0	27.42	44.97	71.90	160.9
109	30.06	46.63	73.24	163.0	35.24	52.29	77.25	166.0	32.52	49.67	75.73	164.0
110	29.01	44.75	71.36	161.1	28.74	45.85	71.52	159.0	44.92	62.85	89.34	179.4
111	25.56	41.43	67.99	158.4	30.28	47.34	73.05	160.9	39.81	57.13	84.50	174.3
112	34.91	50.54	77.50	167.0	22.30	39.29	64.81	153.0	33.02	50.50	77.35	167.0
113	24.50	39.40	67.40	155.8	33.10	50.20	75.70	164.7	39.40	57.20	84.00	173.6
114					No separate zero time							

TABLE 4-12. TEST 6 TIME OF ARRIVAL DATA (Continued)

EVENT NUMBER	TIME OF ARRIVAL (ms)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
115	35.21	53.95	80.33	168.6	27.62	44.82	70.60	157.7	26.70	43.87	70.39	159.0
116	22.55	38.09	64.41	154.0	32.04	49.19	74.41	162.0	44.49	62.56	86.14	178.0
117	34.27	51.32	78.05	168.0	31.31	47.92	72.99	160.3	30.22	47.60	74.27	163.5
118	27.73	45.01	71.29	160.3	30.66	47.56	72.74	160.3	34.65	52.12	78.47	167.0
119	21.22	38.19	64.27	153.5	35.51	52.48	77.41	165.5	43.35	60.68	86.65	175.0
120	27.90	45.33	71.10	159.6	29.70	46.39	71.44	159.0	33.80	50.90	76.91	165.0
121	36.47	52.49	79.41	168.6	23.41	40.19	65.59	153.0	26.98	44.43	70.94	160.3
122	24.82	41.65	67.58	156.0	31.37	47.93	73.25	161.0	37.60	55.52	82.46	171.0
123	29.01	46.30	72.66	163.5	27.13	43.78	68.46	156.5	40.73	58.50	85.41	175.5
124	36.90	52.80	80.10	166.0	18.40	34.70	58.50	145.7	32.40	49.60	75.10	163.5
125	39.40	56.00	83.30	167.3	34.90	49.60	75.70	162.2	27.00	44.50	70.60	159.6
126	26.10	42.60	68.70	157.7	22.30	38.20	63.60	150.0	46.10	64.90	91.60	181.3
127	35.60	52.20	79.50	169.2	21.30	38.50	63.60	151.4	40.10	58.50	85.90	169.2
128	30.50	46.40	73.10	174.9	15.00	33.10	58.50	146.3	13.40	30.80	57.20	146.3
129						No separate zero time						
130	34.30	51.50	78.20	169.0	30.80	49.00	75.10	162.8	33.70	51.50	78.90	167.9
131	29.59	47.08	73.99	163.0	26.62	43.99	69.32	157.5	37.50	54.25	81.01	170.0
132	34.30	51.50	78.20	168.6	22.90	40.10	69.32	153.0	38.80	54.25	81.01	172.4
133	45.30	63.06	89.57	180.0	36.48	53.62	79.01	167.0	19.70	37.05	63.31	152.5
134	35.14	52.20	78.88	170.0	32.73	49.51	74.54	162.0	32.40	50.01	77.00	166.5
135	37.44	54.48	80.87	171.5	35.00	53.00	78.20	166.0	33.74	51.40	78.02	168.0
136	31.08	48.27	74.72	165.0	33.89	51.31	76.94	166.0	35.09	52.75	79.77	169.5
137						No separate zero time						
138	38.25	55.04	81.24	173.0	26.38	43.05	67.77	155.0	37.52	54.67	80.88	169.5
139	27.04	44.44	71.04	160.5	28.89	46.12	71.81	160.0	39.66	57.61	85.00	174.0
140	32.26	49.44	76.07	166.0	32.47	49.82	75.30	163.5	32.54	50.07	76.40	165.0
141	31.75	49.11	75.07	163.0	34.90	52.05	77.61	166.0	30.62	47.77	73.79	162.0
142	38.90	55.96	82.77	173.0	30.15	47.20	72.88	161.0	27.16	44.42	70.75	160.0
143	30.64	48.06	74.14	163.5	31.46	48.35	73.84	162.0	35.18	52.55	78.90	167.0
144	37.74	55.32	82.15	172.0	28.26	45.35	70.61	159.0	28.33	46.23	73.17	163.0
145	84.60	98.60	124.70	NR	58.07	71.92	92.90	175.5	26.82	32.40	49.60	129.8
146	33.07	49.77	75.06	163.0	43.55	60.49	85.03	174.0	31.47	48.05	73.45	161.0
147	30.57	47.70	73.96	163.0	26.10	43.25	68.90	157.0	41.90	60.05	87.10	176.2
148	31.67	49.19	75.57	166.0	24.54	41.73	67.17	155.0	40.28	58.39	85.14	175.0
149	31.71	48.64	75.36	165.0	28.60	45.77	71.42	159.0	30.34	48.07	74.74	165.0
150						No separate zero time						
151	37.06	54.51	81.77	172.0	27.88	45.04	70.45	157.5	26.65	44.13	70.61	160.5
152	32.69	50.11	76.57	166.5	22.12	38.66	63.57	152.0	34.88	52.34	78.90	168.0
153	33.94	51.08	77.31	167.0	18.40	35.44	60.52	148.5	44.25	61.49	88.29	177.0
154	25.79	43.71	70.20	160.5	27.62	44.42	69.37	158.0	42.95	60.30	87.00	177.0
155	26.49	43.41	69.99	160.0	26.86	44.08	69.45	157.5	44.74	62.50	88.30	180.0
156	32.20	49.43	75.95	168.0	31.80	48.83	74.44	163.0	36.83	54.97	81.77	172.0
157	26.57	43.54	69.89	162.0	19.70	37.18	62.67	152.0	21.39	38.63	65.48	155.0
158						No separate zero time						
159	37.06	53.52	80.31	171.0	23.88	40.92	66.28	154.5	34.72	52.48	79.26	169.0
160	35.77	52.26	78.84	170.5	17.80	34.75	59.58	146.8	37.67	54.94	81.14	170.0
161	26.64	44.80	71.13	161.0	9.50	26.10	55.31	139.9	31.80	49.25	76.24	166.0
162						No separate zero time						
163	26.64	37.63	64.20	153.0	8.30	24.80	53.97	137.0	17.80	35.20	61.70	152.0
164	41.19	58.05	84.49	174.0	26.86	43.26	68.10	154.0	32.33	49.12	75.20	163.0
165	30.91	48.47	74.93	165.0	28.55	45.67	70.54	159.0	40.15	57.81	84.59	174.0
166	22.09	39.36	65.82	156.0	18.40	36.56	62.08	149.0	41.20	58.45	85.52	175.0
167						No separate zero time						
168	40.45	57.29	84.17	171.0	33.50	50.72	76.78	165.0	22.83	39.75	65.69	154.5
169	32.03	49.55	75.98	163.0	27.20	43.99	69.46	157.0	32.90	50.41	76.81	166.0
170	31.76	49.00	75.69	165.0	28.71	45.60	71.01	158.0	52.20	57.95	84.60	174.0
171	32.50	50.48	76.04	166.0	24.48	41.11	66.57	155.0	33.94	51.83	78.77	168.0

TABLE 4-12. TEST 6 TIME OF ARRIVAL DATA (Continued)

EVENT NUMBER	TIME OF ARRIVAL (ms)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
172	28.00	44.19	70.00	162.0	14.60	30.50	55.30	143.7	23.00	40.70	67.40	156.0
173						No separate zero time						
174	40.67	58.45	83.25	175.0	27.00	43.54	68.00	156.0	20.40	37.45	63.87	153.0
175	33.89	51.44	77.86	168.0	28.87	45.80	71.20	160.0	29.67	47.03	73.21	162.0
176	30.18	47.58	73.36	162.0	19.70	36.90	62.04	149.1	41.24	58.69	86.01	174.0
177	33.99	50.95	77.96	168.0	26.79	44.01	69.17	157.0	25.13	42.86	69.57	159.0
178	30.50	46.86	73.50	163.0	27.46	44.43	70.05	158.0	34.74	52.44	79.46	169.5
179	36.71	51.78	78.16	168.0	19.10	35.06	60.38	148.5	44.10	61.32	88.29	177.0
180	27.87	44.36	70.43	160.0	11.40	28.00	52.80	141.0	39.68	57.16	84.52	174.0
181						No zero time						
182	21.66	39.03	65.22	155.0	27.47	45.20	71.16	75.7	NR	66.10	92.20	70.0
183	38.75	56.86	82.77	171.0	29.25	45.81	66.22	158.0	29.59	46.97	73.45	162.0
184	24.25	41.07	66.78	156.0	35.88	52.84	77.52	165.0	41.22	58.36	84.40	173.0
185	39.23	56.54	83.02	171.0	32.55	49.90	75.36	163.5	28.98	46.59	73.19	162.0
186	23.09	39.77	65.50	154.7	25.43	42.52	67.57	154.9	43.42	61.12	87.38	176.0
187	25.12	42.64	68.90	159.0	31.39	48.33	74.12	163.5	44.17	61.65	88.97	178.0
188	42.87	60.61	86.43	178.0	37.86	54.89	80.09	168.0	22.04	38.93	64.91	153.0
189	26.54	43.99	70.33	161.0	28.89	45.83	71.40	160.0	44.18	61.70	88.54	177.0
190	33.39	50.52	77.43	168.0	29.93	47.25	72.96	160.0	35.48	53.41	80.16	170.0
191	34.31	51.50	78.04	165.0	25.94	42.54	68.42	157.0	19.10	36.19	62.76	152.0
192	19.10	36.15	62.17	152.0	33.41	49.34	74.51	162.0	47.56	64.59	91.78	182.0
193	34.45	51.17	77.67	168.0	29.62	46.94	72.76	161.0	21.64	39.06	65.43	154.5
194	34.78	51.81	78.18	167.0	18.40	35.30	61.00	148.5	43.46	61.14	87.90	177.0
195	46.70	64.80	91.04	180.0	43.84	61.33	85.20	174.0	18.00	34.84	60.76	148.5
196	29.75	47.11	73.51	163.5	24.54	41.90	67.36	157.0	42.70	60.24	87.00	177.0
197	37.71	55.16	81.61	171.0	35.62	52.59	77.95	167.0	29.24	46.49	72.81	162.0
198	26.65	44.33	70.60	161.0	31.68	49.15	75.25	165.0	42.11	59.67	86.06	175.0
199	17.20	33.96	59.17	148.0	32.92	49.76	75.49	163.5	48.46	65.85	92.90	181.0
200	25.99	44.26	70.69	162.0	28.53	45.28	70.83	161.0	35.35	52.83	79.12	168.0
201	36.13	52.89	78.93	168.0	23.17	39.60	64.45	151.8	32.40	49.84	76.23	165.0
202	36.83	53.81	79.43	171.0	25.17	41.21	65.70	153.5	37.71	55.03	81.40	171.0
203	25.63	43.19	69.37	160.0	26.50	40.92	67.68	156.0	45.14	63.12	89.51	177.0
204	25.67	42.29	67.75	156.0	35.74	52.03	72.76	165.0	40.08	56.89	82.63	171.0
205	30.34	47.62	73.69	162.0	22.99	39.64	64.64	152.2	45.26	63.09	89.63	178.5
206	28.31	45.44	71.53	162.0	25.26	41.99	67.23	155.0	46.32	64.34	91.07	180.0
207	34.59	52.64	79.29	168.0	28.05	44.84	70.23	159.0	31.22	48.54	74.85	163.5
208	30.20	47.19	73.27	162.0	37.00	53.41	79.10	168.0	36.25	53.11	79.00	167.0
209	31.00	47.59	74.00	164.0	19.70	37.88	63.01	151.0	29.38	46.91	73.34	162.0
210	37.24	54.02	79.66	168.0	15.30	32.40	57.21	145.0	44.56	61.93	88.51	177.0
211	23.73	40.66	66.42	156.0	32.95	50.54	75.81	165.0	41.01	58.06	83.92	172.0
212	42.82	59.67	86.26	175.0	25.89	41.87	66.47	153.5	33.72	50.16	75.75	163.5
213	28.99	46.69	73.07	163.0	34.25	51.56	77.38	167.0	42.62	60.29	86.84	176.0
214	33.76	50.94	77.09	167.0	23.47	39.61	64.60	152.0	12.70	29.30	54.94	143.0
215	32.24	49.83	76.21	166.0	27.97	45.08	70.84	159.0	41.01	58.34	84.87	174.0
216	21.00	37.64	63.57	153.0	36.62	53.98	80.08	168.0	42.75	59.97	85.98	174.0
217	28.19	46.39	72.53	162.0	34.14	51.59	77.42	167.0	38.76	56.25	82.52	171.0
218	34.09	51.75	78.03	168.5	28.88	46.41	72.24	161.0	32.91	50.53	77.03	167.0
219						No separate zero time						
220	29.80	48.59	75.02	165.0	33.10	50.20	76.51	165.5	38.75	56.64	83.34	172.5
221						No separate zero time						
222	39.99	54.41	78.20	165.0	6.40	21.60	45.20	132.5	57.75	76.30	101.80	191.0
223	29.31	46.73	72.68	162.0	29.09	45.50	70.82	160.0	35.12	52.38	77.09	167.0
224	29.31	37.80	64.27	154.1	34.52	51.80	77.30	167.0	52.24	69.82	95.40	186.0
225	33.62	51.20	77.72	168.0	17.20	33.70	59.08	148.0	40.04	57.32	83.82	173.0
226						No separate zero time						
227	23.41	40.58	66.63	156.0	36.61	54.84	80.78	169.0	44.68	61.74	87.79	176.0
228						No separate zero time						

TABLE 4-12. TEST 6 TIME OF ARRIVAL DATA (Continued)

EVENT NUMBER	TIME OF ARRIVAL (ms)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
229	51.88	68.74	96.00	186.0	41.89	58.42	83.37	171.0	19.70	34.83	60.50	148.5
230	30.58	48.02	74.35	163.5	31.17	47.92	71.27	161.0	40.80	58.52	85.23	175.0
231	27.92	45.09	71.09	161.0	24.37	39.93	64.11	152.5	43.74	61.56	88.34	178.0
232	25.69	43.26	69.85	159.0	22.66	39.31	64.25	151.0	29.17	46.92	73.61	164.0
233	48.89	68.08	92.90	182.0	29.30	44.59	69.77	157.0	28.14	43.03	67.83	155.0
234						No separate zero time						
235	37.55	54.75	81.10	171.0	28.85	45.78	71.06	159.0	34.26	51.52	77.98	167.0
236	29.30	46.77	72.70	163.0	26.51	43.38	68.50	156.0	44.86	62.61	89.83	180.0
237	26.63	43.65	69.57	159.0	28.97	45.89	71.14	159.0	44.40	62.12	89.60	178.0
238						No zero time						
239	22.76	39.75	65.59	154.6	26.31	42.25	67.08	154.5	48.06	65.93	92.50	183.0
240	22.76	38.65	64.63	153.8	26.51	42.56	67.33	154.9	37.95	54.85	81.17	171.0
241	15.00	30.50	57.44	147.0	11.40	27.30	52.96	139.0	32.81	50.90	77.62	168.0
242	31.83	49.20	74.88	163.0	22.28	38.69	63.50	150.0	42.30	60.05	86.74	175.5
243	37.52	54.57	80.86	172.0	30.29	46.80	72.17	159.0	33.89	51.62	78.42	168.0
244	33.51	50.67	76.55	167.0	29.47	45.46	70.67	158.0	28.99	46.60	73.14	162.0
245	23.41	40.50	66.39	155.0	32.64	49.36	74.49	162.0	43.11	60.89	87.23	176.0
246						No zero time						
247	22.90	41.30	67.40	156.0	24.20	41.30	66.80	155.0	35.02	52.91	79.90	171.0
248						No zero time						
249	25.80	42.67	68.38	157.0	24.78	40.99	65.66	152.6	45.48	63.21	90.21	180.0
250	46.45	63.28	89.87	180.0	39.08	56.70	81.61	172.0	23.74	40.80	67.03	156.0
251	30.34	46.69	73.10	163.0	20.00	36.80	62.08	150.2	31.62	49.41	76.30	165.0
252						No zero time						
253	42.82	60.53	87.12	177.0	35.02	51.93	77.63	165.5	26.74	43.46	69.33	158.0
254	55.45	72.63	99.40	191.0	45.28	62.04	87.25	175.0	21.78	37.65	63.39	152.0
255	26.90	44.13	70.08	159.3	32.25	49.13	74.45	162.0	39.44	57.15	83.62	172.5
256	32.06	49.45	75.55	165.0	21.78	35.63	60.81	149.0	39.18	56.46	82.83	172.0
257	31.07	48.71	75.03	165.0	28.45	46.06	71.97	161.5	31.08	48.64	75.13	164.0
258	26.01	40.92	65.94	154.6	25.46	39.90	64.23	152.2	60.00	80.30	108.30	198.2
259	35.36	52.72	79.26	169.0	26.74	43.66	68.93	157.0	31.43	48.65	74.88	163.5
260	21.92	38.21	63.55	152.0	26.59	42.41	67.15	155.0	51.52	69.23	96.00	186.0
261	34.01	50.83	76.47	165.0	21.30	38.08	63.27	152.0	48.35	65.65	93.00	183.0
262	35.54	52.52	79.04	169.0	33.26	50.83	76.48	165.0	33.57	51.27	77.93	167.0
263						No separate zero time						
264	31.72	48.93	75.01	163.0	26.41	43.36	68.80	157.5	44.83	62.67	89.51	178.0
265	36.71	54.14	80.55	171.0	27.99	45.06	70.56	159.0	38.39	55.71	82.15	172.0
266	27.65	45.11	71.37	161.0	34.68	51.65	77.21	165.3	41.62	59.30	85.77	175.0
267	35.21	52.53	78.50	168.0	34.12	51.23	76.50	165.0	27.97	45.00	71.10	159.5
268	33.16	46.66	70.24	156.5	12.70	26.10	49.70	135.5	60.50	78.40	105.10	195.0
269	28.24	45.60	71.79	161.5	34.33	51.33	76.51	164.0	38.35	56.05	82.42	171.0
270	26.46	43.58	70.16	159.0	18.00	35.26	60.66	158.0	24.26	41.78	68.23	158.0
271	29.24	46.60	72.71	162.0	34.72	52.16	77.54	165.0	36.23	53.55	79.70	168.0
272	36.67	54.93	80.53	169.5	37.77	55.36	80.86	169.5	25.09	41.97	67.89	156.3
273	32.50	49.93	76.00	165.0	37.09	54.25	79.56	168.0	31.25	48.70	74.81	163.0
274	30.83	48.48	74.82	165.0	30.32	47.67	72.66	161.0	43.94	61.58	88.16	177.0
275	30.21	47.53	73.75	163.0	30.44	47.76	73.30	162.0	40.68	58.17	84.64	159.0
276	28.20	46.22	72.25	162.0	33.77	51.12	76.58	165.0	38.42	55.78	81.98	172.0
277	21.00	37.79	63.77	153.2	33.70	49.98	75.03	163.0	51.92	69.59	96.80	186.0
278	39.60	57.20	83.50	174.0	31.72	49.05	74.34	162.5	31.59	48.60	74.83	164.0
279	32.14	49.53	76.15	166.0	24.80	42.00	67.59	156.0	27.64	45.25	71.95	162.0
280	31.58	49.02	75.39	165.0	28.84	46.14	71.56	160.0	31.29	48.92	75.42	165.0
281	21.48	37.48	62.79	152.0	24.23	39.63	63.70	150.8	48.22	69.82	94.00	189.0
282	NR	70.21	88.89	180.0	26.77	43.52	71.79	159.0	43.30	60.50	86.52	175.0
283	39.19	56.69	82.89	172.0	31.52	48.59	73.68	162.0	32.29	49.69	76.07	165.0
284	30.60	48.08	74.74	165.0	23.60	40.53	65.86	154.0	27.04	44.81	71.55	161.0
285						No zero time						

TABLE 4-12. TEST 6 TIME OF ARRIVAL DATA (Continued)

EVENT NUMBER	TIME OF ARRIVAL (ms)											
	POSITION NUMBER											
	P1 (48.9 ft)	P2 (69.1 ft)	P3 (98.3 ft)	P4 (199.3 ft)	P5 (49.6 ft)	P6 (69.9 ft)	P7 (99.2 ft)	P8 (199.5 ft)	P9 (48.9 ft)	P10 (68.7 ft)	P11 (98.9 ft)	P12 (198.6 ft)
286	28.54	45.66	71.42	160.0	38.14	55.52	81.60	169.0	34.56	51.54	78.40	167.0
287	33.78	51.37	77.67	167.0	30.31	48.06	73.65	162.0	40.23	57.87	84.45	174.0
288	28.66	46.14	72.31	162.0	29.15	46.16	71.45	160.0	40.63	58.15	84.57	174.0
289	57.79	75.00	100.70	189.0	55.49	73.37	100.00	188.0	8.30	24.20	49.70	137.6
290	37.83	55.41	81.52	171.0	26.06	43.24	68.63	156.5	40.20	57.61	84.00	172.5
291	28.21	45.62	71.40	161.0	33.69	50.79	77.12	163.0	40.16	56.07	84.25	162.0
292	26.04	43.45	69.56	159.0	34.36	51.43	76.67	165.0	44.45	61.90	88.18	177.0
293	37.94	55.45	81.65	171.0	30.43	47.87	73.32	162.0	36.27	53.67	80.07	169.5
294	48.46	66.04	92.50	182.0	41.92	58.84	83.38	171.5	20.40	37.24	63.47	152.2
295	43.57	61.11	86.51	177.0	37.25	54.07	79.12	165.0	27.67	45.17	71.72	161.0
296	28.75	45.94	71.91	160.0	29.45	46.59	71.80	159.0	42.40	59.93	86.38	175.5
297	24.14	41.09	66.91	156.0	40.41	57.88	83.49	172.0	40.92	58.01	84.04	172.5
298	24.00	42.50	68.50	157.6	37.40	68.50	78.10	168.4	37.40	54.60	80.00	167.8
299	36.91	53.25	78.63	167.0	15.00	31.50	56.27	159.0	48.47	66.04	93.00	182.0
300	30.06	47.38	73.37	162.5	36.28	53.79	79.24	167.0	37.15	54.56	80.91	171.0
301	35.33	52.61	78.45	168.0	27.05	44.34	69.35	157.5	42.42	60.00	86.56	176.0
302	51.34	68.69	95.40	184.5	38.40	54.82	79.20	166.0	26.60	42.78	68.47	157.0
303	29.11	46.04	71.62	161.0	44.26	61.64	86.85	174.5	33.74	50.53	76.26	165.0
304	34.52	52.54	78.38	167.0	42.12	59.44	84.80	172.5	32.11	49.27	75.39	164.0
305	24.43	41.23	66.78	172.0	30.10	46.64	71.37	158.5	46.39	63.85	90.19	179.0
306	21.51	38.56	64.29	153.2	33.88	80.83	76.06	163.5	47.46	64.97	91.22	180.0
307	40.97	58.35	84.26	173.0	48.26	66.39	92.07	180.0	28.30	45.52	71.71	160.0
308					No separate zero time							
309	14.00	30.00	55.77	145.0	38.11	53.94	78.02	165.0	57.98	75.50	102.40	191.0
310	56.54	73.80	100.50	191.0	34.67	50.66	75.39	162.5	31.88	47.91	73.59	162.0
311	43.64	60.94	86.90	176.0	44.78	62.06	87.59	176.0	22.39	39.71	65.95	155.0
312	41.40	58.87	84.99	174.0	29.83	46.91	72.06	160.0	34.72	51.91	78.19	167.0
313	25.09	42.26	68.13	157.5	35.74	52.87	78.08	166.0	42.06	59.46	85.64	174.0
314	28.11	45.09	71.08	160.5	45.45	62.94	88.50	176.5	39.92	57.25	83.22	172.0
315	40.22	56.85	82.24	172.0	18.50	35.31	60.45	148.1	47.77	64.91	91.11	180.0
316	47.20	61.69	85.16	172.0	69.30	86.50	112.60	201.0	23.40	36.16	59.39	146.0
317	21.60	37.99	63.45	152.4	48.88	65.87	90.95	178.5	42.54	59.08	84.94	173.0
318	35.05	52.34	78.32	167.0	40.83	58.25	83.66	172.0	32.54	49.86	75.99	164.8
319	40.37	57.82	83.89	174.0	38.51	55.82	81.05	169.0	28.06	45.12	71.11	159.0
320	40.50	58.06	84.23	174.0	31.03	48.35	73.61	161.0	35.17	52.28	78.43	167.0
321	39.17	55.70	80.83	169.0	51.68	69.05	95.40	183.0	23.41	40.02	65.76	154.2
322	33.93	50.78	76.44	165.5	25.92	43.03	68.23	156.0	47.72	65.20	91.54	180.5
323	29.51	46.56	72.43	161.5	28.97	46.18	71.51	159.5	46.23	63.86	90.27	179.8
324	29.51	46.56	72.43	161.5	28.97	46.18	71.51	153.0	46.23	63.86	90.27	185.0

NR: no useable record

TABLE 4-13. TEST 6 TEMPERATURE DATA

POSITION IN STACK	BOX NUMBER	DESCRIPTION	MAXIMUM TEMPERATURE (°C)
2BZ	9	in projectile	500
2BX	3	in projectile	100
2BZ	9	top of box	135
2BX	3	top of box	980
1AY	3	top of box	700
2BZ	13	in projectile	290
2BZ	13	face of box next to adjacent pallet	1190
2BY	15	outward face of box	700
3BY	13	outward face of box	1040

*See Figure 3-4 for further description of location

CHAPTER 5

ANALYSIS/INTERPRETATION

Only the data from test 6 will be analyzed further. This is for two reasons. First, because of the large number of events involved, all of the other tests may be interpreted as sub-sets of the test 6 data. Second, test 6 provided true shock time of arrival for each event at each transducer. This allows an estimate of the event location to be made. Once the event location is determined, a yield that is based on its pressure-distance decay characteristics can be determined.

This chapter describes the methodology which was used to estimate each event location. It then presents in both tabular and graphical form the locations determined for each event. The second half of the chapter deals with the determination of yield for each event. It describes the methodology which was applied and then discusses the results which were obtained; i.e., those events which appeared to be high-order detonations (100 percent yield) and those events which were merely propellant reactions (approximately 0.1 percent yield or less).

DETERMINATION OF EVENT LOCATIONS

An iterative procedure was set up to determine the location of each event. Because the airblast overpressures were quite low, usually below 1 or 2 psi, it was assumed that all signals propagated at sonic velocity. It was further assumed that because of the fire, there was a sound velocity gradient across the ground zero area--with the sound velocity proportional to the ambient temperature.

The analysis procedure works as follows and would be repeated for each event. An arbitrary event location is chosen (usually the center of the ground zero area--coordinates (0,0)). Arrival times based on sonic velocities are calculated to each gauge position as follows: radial distance between the chosen event location and the known gauge position is divided by the sound velocity. This calculated arrival time is subtracted from the measured arrival time and the resulting difference is squared. This squared difference is summed for all of the gauge positions (P1 through P12). This procedure is repeated until this sum is minimized. The event location which is reported is that location that minimizes this squared difference.

The locations determined for each event are presented in Table 5-1. As a sensitivity check on the procedure, a constant propagation velocity (no fire-induced gradient) was assumed and several of the cases were rerun. The differences in the final locations were not significant. Because of the assumptions which were involved,

it is the author's judgement that the locations presented in Table 5-1 are only accurate to about ± 15 percent.

The same information presented in Table 5-1 is also presented in Figures 5-1 through 5-3. These are scatter plots showing the locations of the events around the ground zero area. The immediate ground zero area was covered by a 20' x 20' concrete pad. This pad is also shown in the figures, which are simply different views of the same information.

DETERMINATION OF EVENT YIELDS

Two questions will be addressed in this portion of the report. The first is, "Of those events listed in Table 4-10, which ones were produced by propellant reactions?" The second is, "Which events were true high-order detonations?"

Based on the description of the charge which was presented in Chapter 2, airblast predictions were made using Porzel's Unified Theory of Explosions.¹¹ Three predictions were made--a 100-percent yield (high-order detonation), a 5-percent yield, and a 0.5-percent yield; these are shown in Figure 5-4. The 100-percent yield represents the predicted curve for the detonation of 4.5 pounds of TNT inside a 105 mm projectile body weighing approximately 24 pounds; the 0.5-percent yield represents the detonation of 0.0225 pound (10 grams) inside the same projectile body. These prediction curves were then used to "calibrate" a yield determination program--DSC.¹¹ The program DSC was written around concepts and techniques which were developed for the analysis of nuclear blast yields. The program evaluates a pressure-distance curve and produces an absolute yield in megacalories. The data which were presented in Figure 5-4 were run through the DSC program to provide a relationship between absolute yield in megacalories and a relative yield in percent. These relative yields in percent are the yields which are required for this analysis.

The pressure-distance curves generated for each event listed in Table 4-10 were analyzed using the computer program DSC. When an event location was not known, a location was assumed and an approximate pressure-distance curve was generated. The absolute yields which were determined were converted to relative yields and these results tabulated in Table 5-2; the same results are plotted in Figure 5-5.

Based on the numbers of recovered projectiles, it is assumed that 318 projectiles reacted; 324 events were recorded and tabulated. Examining Figure 5-5, the six events with the lowest yields were selected as "propellant" events. All of the selected events had yields of less than 0.10 percent. The six events were events 1, 7, 113, 172, 258, and 282. These six events are plotted with a different symbol in Figure 5-5 and are noted in the comments of Table 5-2.

One event was produced by a high-order detonation with a yield of 100 percent--event 35. This was an event for which there was no zero time. Thus an estimated position was used to make the yield determination.

When the six "propellant" events are excluded, the average yield which was observed was 10 percent. If Figure 5-5 is examined closely, another trend can be discerned. As the event number increases, corresponding to increasing time after the first event or the start of the fire, the yield seems to be increasing. This may be analogous to what is observed in cook-off testing, where slow cook-off tests produce more violent results than do fast cook-off tests.

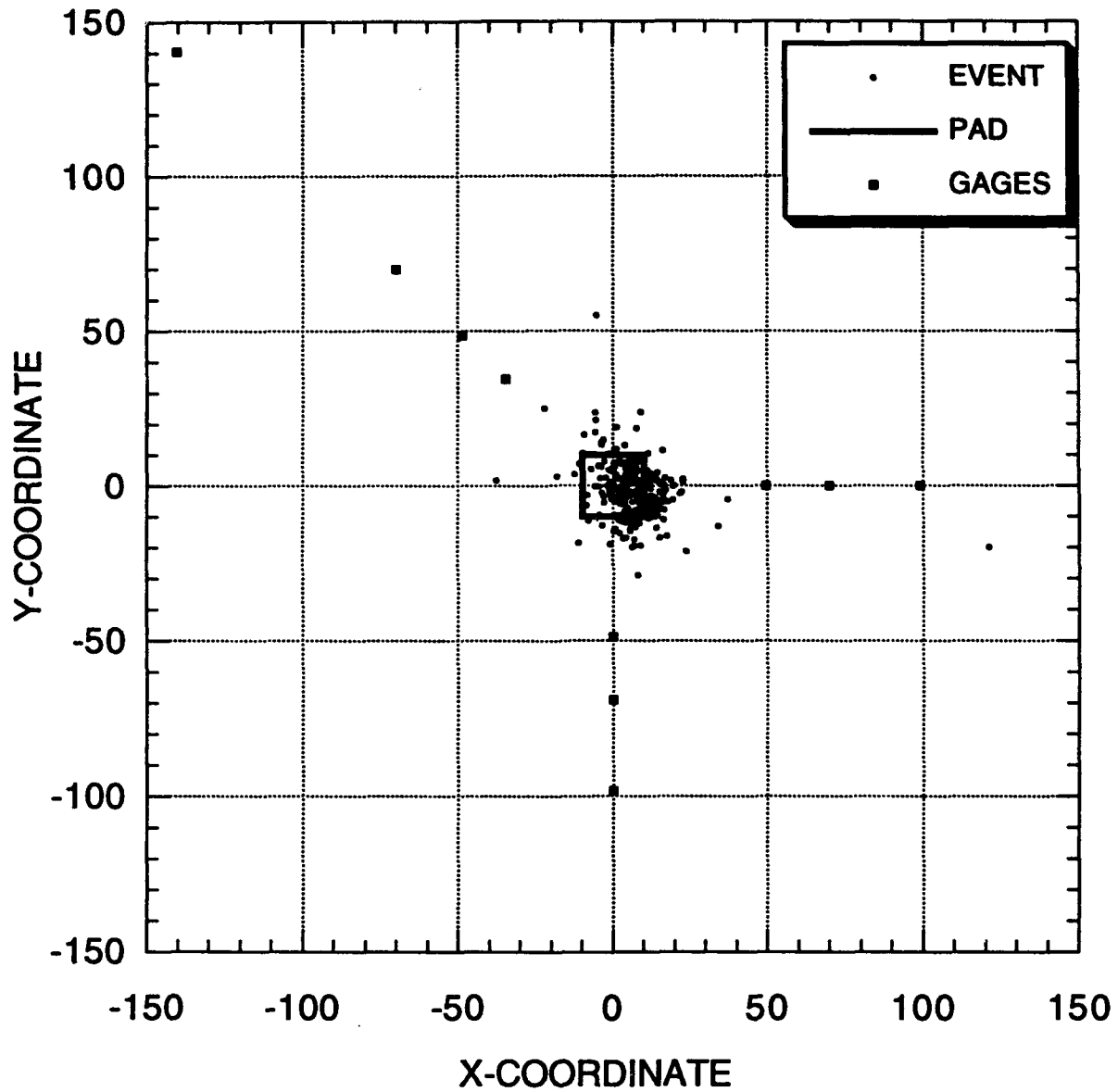


FIGURE 5-1. TEST 6 CALCULATED EVENT LOCATIONS
(BROAD VIEW)

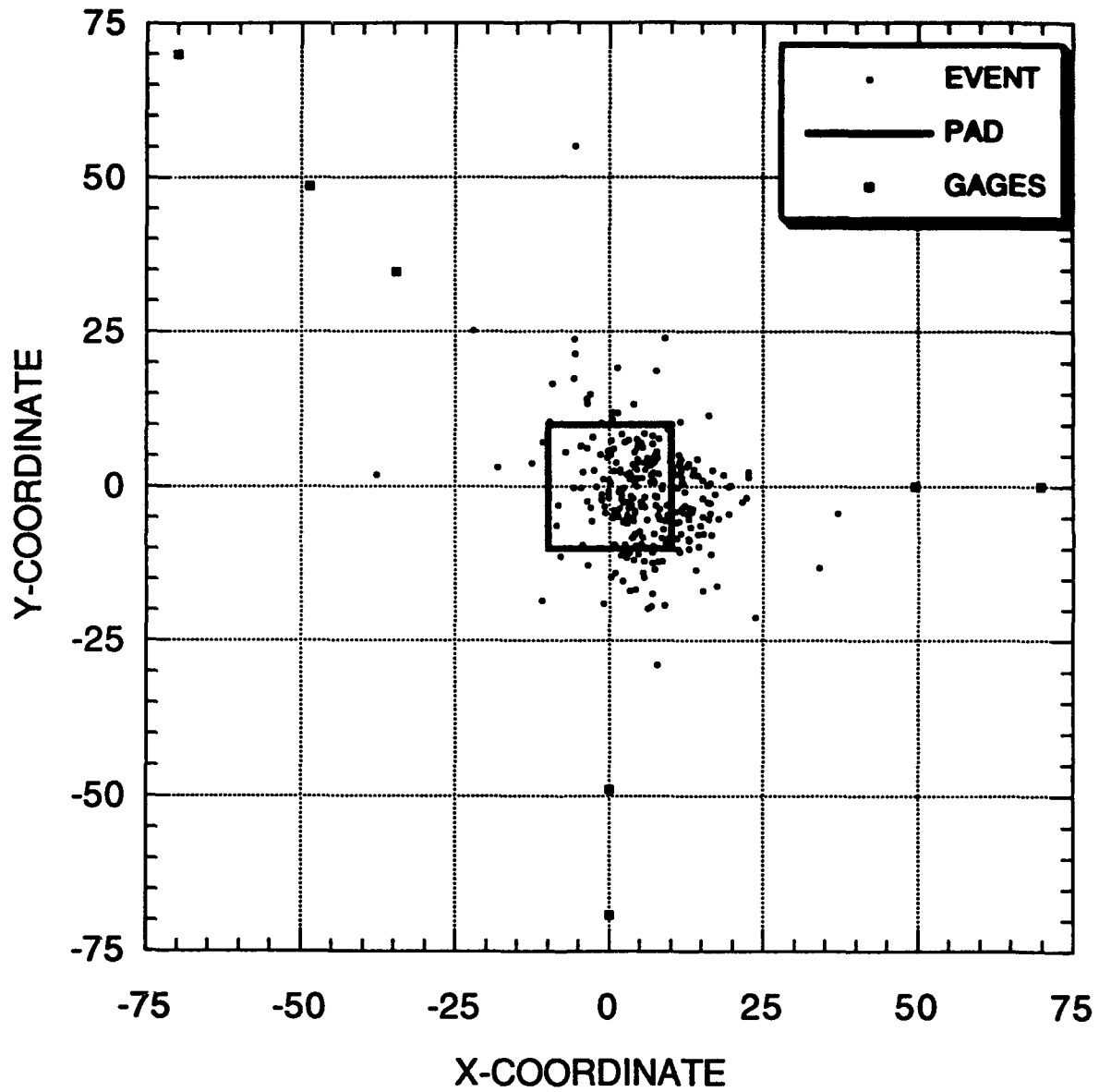


FIGURE 5-2. TEST 6 CALCULATED EVENT LOCATIONS
(INTERMEDIATE VIEW)

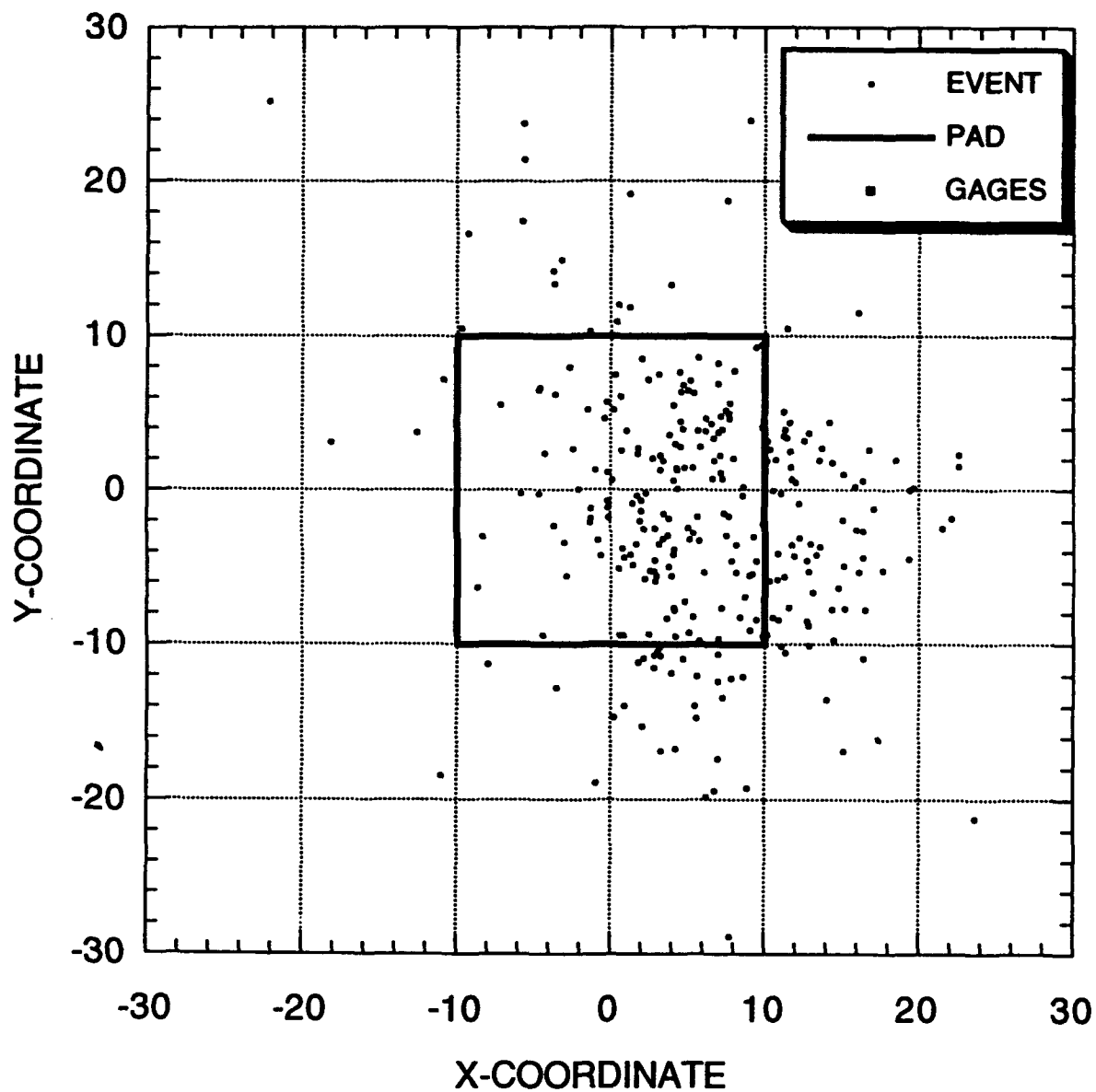


FIGURE 5-3. TEST 6 CALCULATED EVENT LOCATIONS
(NARROW VIEW)

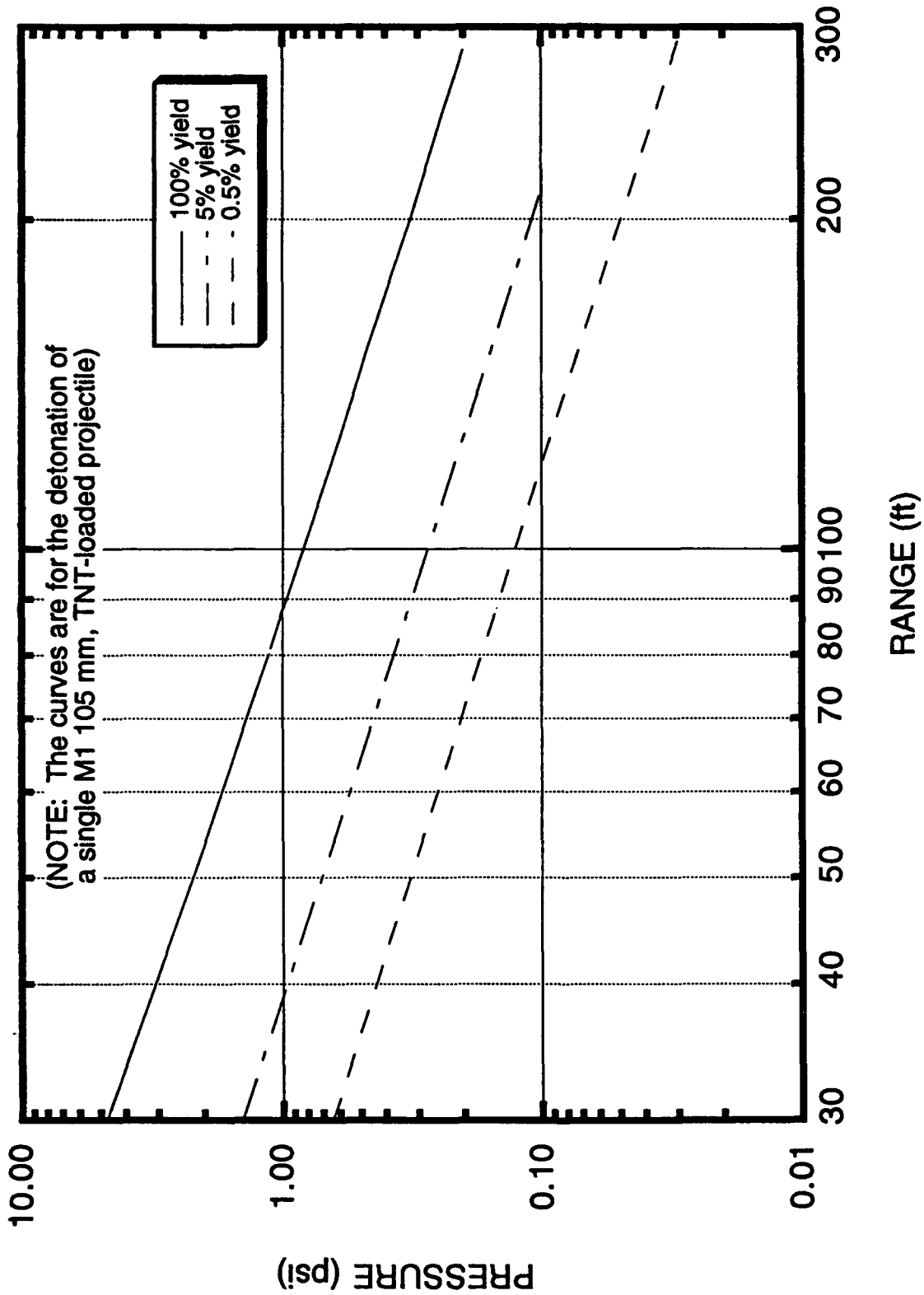


FIGURE 5-4. PREDICTED PRESSURE-DISTANCE CURVES

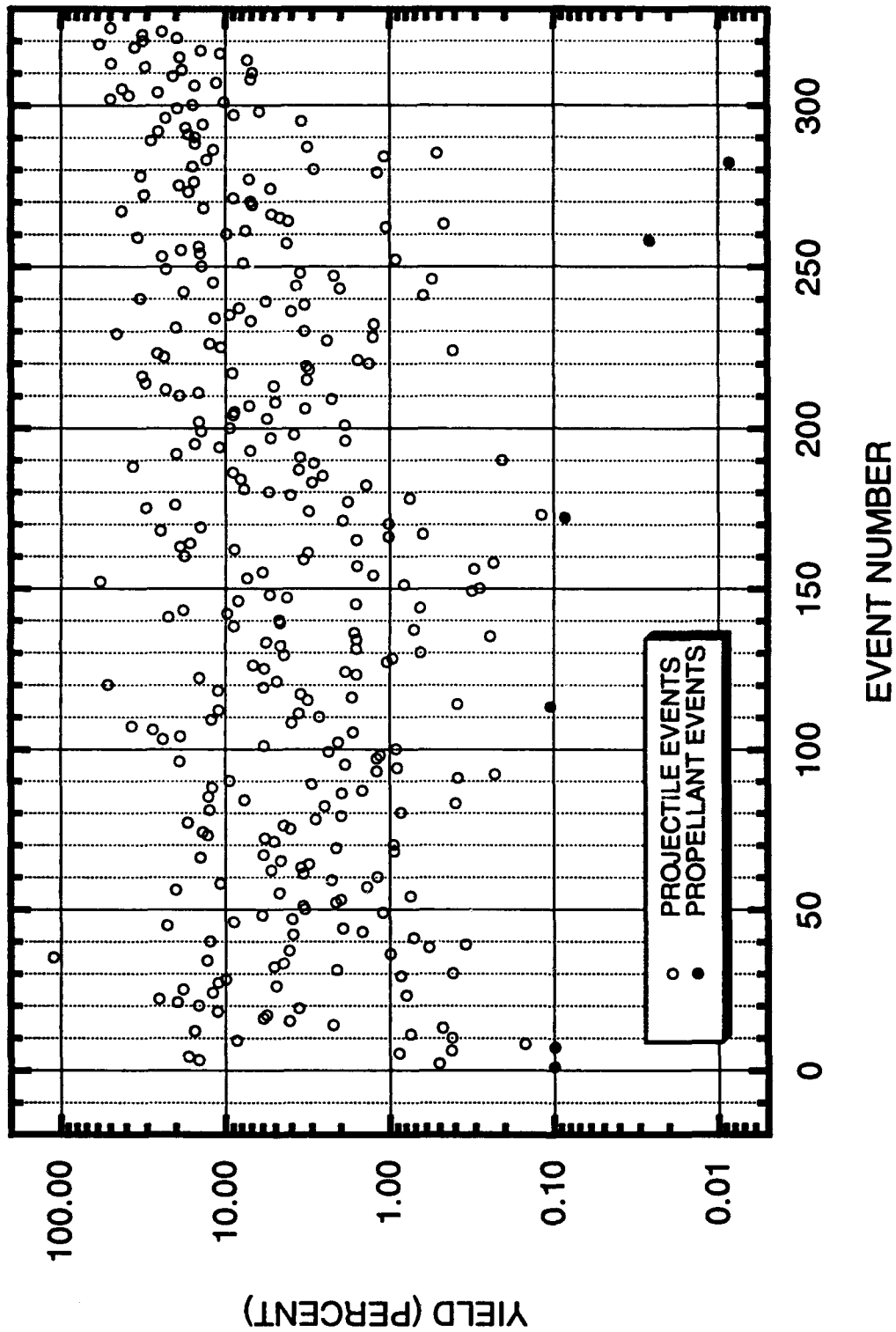


FIGURE 5-5. EVENT 6 YIELD ANALYSIS

TABLE 5-1. TEST 6 CALCULATED EVENT LOCATIONS

Event Number	Digital Record Number	COORDINATES*	
		X0 (ft)	Y0 (ft)
1	1	2.0	-1.4
2	2	-0.2	-1.1
3	3	8.0	2.0
4	3A	NZT	NZT
5	4	-0.2	1.1
6	5	7.3	0.7
7	6	11.1	-0.2
8	7	3.4	-3.2
9	8	13.3	-4.2
10	9	1.0	3.9
11	10	0.7	2.5
12	11	10.4	2.6
13	12	3.1	-3.5
14	13	-0.2	-0.7
15	14	15.1	-1.9
16	15	-3.7	-2.3
17	16	3.8	-1.9
18	17	11.7	-3.5
19	18	6.2	3.8
20	19	-0.1	-1.8
21	20	11.9	-4.2
22	20A	NZT	NZT
23	21	4.2	3.0
24	22	10.5	0.0
25	22A	NZT	NZT
26	23	7.8	-12.2
27	23A	NZT	NZT
28	24	-1.3	-1.9
29	25	0.1	0.7
30	26	-1.0	1.3
31	27	-3.6	6.2
32	28	3.2	-10.8
33	29	6.7	3.3
34	30	16.3	0.6
35	30A	NZT	NZT
36	31	-4.6	6.6
37	32	1.4	-0.9
38	33	2.9	-2.5
39	33A	NZT	NZT
40	34	10.8	-5.8
41	35	0.9	-9.5
42	36	-3.1	-3.4
43	37	4.5	2.8
44	38	3.2	-10.2
45	39	6.7	1.9
46	40	7.0	-9.7
47	41	8.6	-12.1
48	42	11.6	-7.6
49	43	3.5	-1.6
50	44	7.5	-3.0
51	44A	NZT	NZT
52	45	2.8	-5.3
53	45A	NZT	NZT
54	46	4.1	-7.8
55	47	-7.1	5.5
56	48	13.6	-3.7
57	49	5.1	-3.2
58	50	9.9	-2.3
59	51	0.7	-3.8
60	52	5.1	-9.3
61	52A	NZT	NZT
62	53	7.3	-13.4
63	53A	NZT	NZT
64	54	1.8	2.7
65	55	121.0	-19.9
66	56	3.8	3.6
67	57	-1.3	-2.1
68	58	0.8	-4.4
69	59	8.6	0.2
70	60	1.4	-4.9
71	61	9.4	-4.6
72	62	16.4	-4.4
73	63	5.2	7.1
74	64	-2.5	2.7
75	65	-10.8	7.2
76	66	13.0	-3.5
77	67	2.8	-4.6
78	68	9.1	-9.1
79	69	2.8	-10.7
80	70	4.2	-16.7
81	71	7.0	-12.4
82	72	3.9	-5.6
83	73	2.2	-2.5
84	74	12.9	-10.1
85	74A	NZT	NZT
86	75	4.3	1.3
87	76	17.6	-5.2
88	76A	NZT	NZT
89	77	5.7	3.9
90	78	-1.5	5.2
91	79	2.0	-2.0
92	79A	NZT	NZT
93	80	3.3	-16.9
94	80A	NZT	NZT
95	81	7.8	4.6
96	82	13.6	1.9
97	83	3.9	-11.8
98	83A	NZT	NZT
99	84	3.2	1.3
100	85	2.3	-0.2

TABLE 5-1. TEST 6 CALCULATED EVENT LOCATIONS (Continued)

Event Number	Digital Record Number	COORDINATES*	
		X0 (ft)	Y0 (ft)
101	86	13.7	2.7
102	87	5.4	-14.0
103	88	11.4	3.4
104	89	9.9	4.0
105	90	0.6	-9.4
106	91	-4.3	2.4
107	92	1.7	-0.4
108	93	0.2	5.2
109	94	-0.8	-3.2
110	95	10.2	-9.3
111	96	5.7	-9.8
112	97	10.8	2.0
113	98	2.8	-11.5
114	98A	NZT	NZT
115	99	4.1	5.5
116	100	5.6	-14.8
117	101	3.2	2.2
118	102	3.8	-5.0
119	103	2.1	-15.3
120	104	4.1	-4.2
121	105	7.7	5.6
122	106	4.2	-9.5
123	107	10.3	-5.9
124	108	14.2	4.4
125	109	0.7	6.1
126	110	16.4	-10.9
127	111	15.1	1.0
128	112	5.7	8.6
129	113	NZT	NZT
130	114	4.1	0.6
131	115	8.1	-3.6
132	116	12.0	0.5
133	117	-3.2	14.9
134	118	3.4	1.9
135	119	1.8	2.3
136	120	1.6	-3.5
137	120A	NZT	NZT
138	121	11.3	3.9
139	122	7.2	-7.7
140	123	2.0	-0.7
141	124	-1.3	-1.2
142	125	3.2	7.5
143	126	3.7	-2.9
144	127	5.4	6.3
145	128	-5.5	55.1
146	129	-8.3	-3.0
147	130	11.3	-5.6
148	131	12.2	-3.1
149	132	4.4	0.1
150	132A	NZT	NZT
151	133	4.7	6.8
152	134	11.8	0.7
153	135	14.4	1.8
154	136	6.0	-5.4
155	137	11.1	-10.1
156	138	5.0	-2.4
157	139	5.3	1.4
158	139A	NZT	NZT
159	140	11.3	3.5
160	141	16.8	2.6
161	142	17.1	-1.2
162	142A	NZT	NZT
163	143	11.7	2.5
164	144	9.8	9.4
165	145	9.3	-3.0
166	146	15.2	-7.7
167	146A	NZT	NZT
168	147	-1.4	10.3
169	148	7.1	1.1
170	149	10.9	-4.1
171	150	10.2	1.9
172	151	11.7	4.4
173	151A	NZT	NZT
174	152	3.9	13.3
175	153	4.6	4.5
176	154	16.4	-2.7
177	155	4.6	6.4
178	156	7.4	-1.5
179	157	19.7	0.1
180	158	21.5	-2.5
181	159	NZT	NZT
182	160	9.5	9.3
183	161	7.0	8.2
184	162	1.8	-11.2
185	163	2.5	7.2
186	164	11.4	-10.5
187	165	7.0	-10.6
188	166	-3.6	13.4
189	167	9.5	-8.4
190	168	6.6	0.7
191	169	2.1	8.5
192	170	7.0	-17.4
193	171	0.3	7.5
194	172	19.4	0.0
195	173	-9.3	16.6
196	174	12.7	-4.6
197	175	-0.3	5.7
198	176	5.4	-8.2
199	177	6.2	-19.8
200	178	5.7	-3.3

TABLE 5-1. TEST 6 CALCULATED EVENT LOCATIONS (Continued)

Event Number	Digital Record Number	COORDINATES*	
		X0 (ft)	Y0 (ft)
201	179	11.3	5.1
202	180	12.9	3.7
203	181	12.8	-8.5
204	182	2.5	-9.4
205	183	16.1	-5.3
206	184	14.4	-7.8
207	185	6.2	4.6
208	186	-0.7	-4.3
209	187	10.2	3.2
210	188	22.6	1.5
211	189	3.0	-10.5
212	190	11.4	10.5
213	191	4.1	-7.7
214	192	1.3	11.9
215	193	9.9	-2.2
216	194	0.2	-14.7
217	195	2.2	-5.8
218	196	5.8	2.8
219	196A	NZT	NZT
220	197	4.1	-3.8
221	198	NZT	NZT
222	199	37.1	-4.3
223	200	5.7	-1.7
224	201	6.8	-19.4
225	202	18.5	1.9
226	202A	NZT	NZT
227	203	0.9	-14.0
228	203A	NZT	NZT
229	204	-5.6	21.4
230	205	7.8	-4.6
231	206	14.8	-6.3
232	207	8.6	-0.4
233	208	7.6	18.7
234	208A	NZT	NZT
235	209	7.7	5.0
236	210	13.1	-6.6
237	211	9.9	-9.5
238	212	NZT	NZT
239	213	14.0	-13.5
240	214	8.4	-8.3
241	215	16.6	-7.8
242	216	16.0	-2.6
243	217	7.2	4.8
244	218	4.7	4.0
245	219	5.6	-12.0
246	220	NZT	NZT
247	221	9.0	-5.5
248	222	NZT	NZT
249	223	14.5	-9.7
250	224	-3.7	14.2
251	225	11.7	1.5
252	226	NZT	NZT
253	227	0.5	12.0
254	228	-5.7	23.7
255	229	4.9	-7.2
256	230	15.9	0.2
257	231	4.3	1.4
258	232	23.6	-21.2
259	233	7.5	5.2
260	234	15.1	-16.9
261	235	19.3	-4.5
262	236	2.7	2.0
263	236A	NZT	NZT
264	237	12.9	-5.3
265	238	10.0	2.8
266	239	3.7	-8.4
267	240	-0.4	4.7
268	241	34.0	-13.1
269	242	2.9	-5.9
270	243	7.1	2.2
271	244	1.3	-4.2
272	245	-4.6	6.5
273	246	-2.1	0.0
274	247	9.2	-5.4
275	248	5.3	-2.8
276	249	3.0	-5.6
277	250	8.9	-19.2
278	251	4.5	7.7
279	252	6.6	4.3
280	253	4.8	1.4
281	254	17.4	-16.1
282	255	16.1	11.5
283	256	5.0	6.5
284	257	7.3	3.9
285	258	NZT	NZT
286	259	-2.9	-5.6
287	260	7.7	-1.7
288	261	8.1	-5.3
289	262	2.2	25.2
290	263	12.6	3.2
291	264	2.5	-5.2
292	265	4.7	-10.9
293	266	7.0	3.8
294	267	-5.8	17.4
295	268	0.4	10.9
296	269	8.7	-6.9
297	270	-3.5	-12.8
298	271	-4.4	-9.4
299	272	22.2	-1.8
300	273	0.5	-5.1

TABLE 5-1. TEST 6 CALCULATED EVENT LOCATIONS (Continued)

Event Number	Digital Record Number	COORDINATES*	
		X0 (ft)	Y0 (ft)
301	274	12.2	-0.8
302	275	1.3	19.2
303	276	-8.7	-6.3
304	277	-5.8	-0.2
305	278	10.5	-8.3
306	279	-0.9	-18.9
307	280	-12.6	3.7
308	280A	NZT	NZT
309	281	7.8	-28.9
310	282	9.0	23.9
311	283	-9.7	10.5
312	284	8.1	7.7
313	285	2.1	-10.9
314	286	-8.0	-11.3
315	287	22.6	2.3
316	288	-37.7	1.9
317	289	-11.0	-18.5
318	290	-4.7	-0.2
319	291	-2.7	8.0
320	292	7.0	6.9
321	293	-18.1	3.1
322	294	15.1	-4.9
323	295	10.9	-8.4
324	296	12.9	-8.8

NZT: no zero time

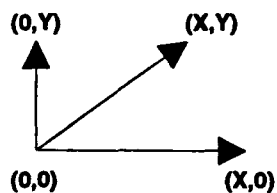


TABLE 5-2. TEST 6 EVENT YIELDS

EVENT NUMBER	YIELD (%)	COMMENTS	EVENT NUMBER	YIELD (%)	COMMENTS
1	0.10	Propellant Event	51	3.36	
2	0.50		52	2.12	
3	14.54		53	1.98	
4	16.81		54	0.75	
5	0.87		55	4.71	
6	0.42		56	20.01	
7	0.10	Propellant Event	57	1.37	
8	0.15		58	10.77	
9	8.50		59	2.26	
10	0.42		60	1.19	
11	0.74		61	3.36	
12	15.40		62	5.27	
13	0.47		63	3.48	
14	2.22		64	3.11	
15	4.07		65	4.62	
16	5.89		66	14.25	
17	5.62		67	5.89	
18	11.22		68	0.94	
19	3.57		69	2.13	
20	14.55		70	0.94	
21	19.61		71	5.06	
22	25.25		72	5.81	
23	0.79		73	12.88	
24	12.03		74	13.84	
25	18.11		75	4.04	
26	4.95		76	4.45	
27	11.10		77	17.04	
28	9.99		78	2.85	
29	0.86		79	1.98	
30	0.41		80	0.86	
31	2.11		81	12.54	
32	5.09		82	2.50	
33	4.43		83	0.40	
34	12.92		84	7.73	
35	110.64	High Order Detonation	85	12.79	
36	0.99		86	1.97	
37	4.11		87	1.48	
38	0.58		88	12.09	
39	0.35		89	3.00	
40	12.52		90	9.44	
41	0.72		91	0.38	
42	3.91		92	0.23	
43	1.48		93	1.20	
44	1.93		94	0.90	
45	22.82		95	1.87	
46	8.97		96	18.91	
47	3.93		97	1.19	
48	5.97		98	1.14	
49	1.10		99	2.35	
50	3.29		100	0.91	

TABLE 5-2. TEST 6 EVENT YIELDS (Continued)

EVENT NUMBER	YIELD (%)	COMMENTS	EVENT NUMBER	YIELD (%)	COMMENTS
101	5.84		151	0.82	
102	2.07		152	57.76	
103	23.96		153	7.41	
104	18.75		154	1.27	
105	1.68		155	5.95	
106	27.44		156	0.31	
107	37.12		157	1.58	
108	3.96		158	0.23	
109	12.17		159	3.37	
110	2.68		160	17.80	
111	3.57		161	3.15	
112	10.99		162	8.84	
113	0.10	Propellant Event	163	18.99	
114	0.39		164	16.50	
115	3.14		165	1.59	
116	1.70		166	1.02	
117	3.50		167	0.63	
118	11.16		168	24.81	
119	5.88		169	14.31	
120	51.52		170	1.02	
121	4.88		171	1.94	
122	14.45		172	0.09	Propellant Event
123	1.60		173	0.12	
124	1.86		174	3.13	
125	5.83		175	30.33	
126	6.85		176	20.19	
127	1.04		177	1.80	
128	0.96		178	0.75	
129	4.43		179	4.03	
130	0.65		180	5.42	
131	1.59		181	7.74	
132	4.63		182	1.38	
133	5.65		183	2.98	
134	1.60		184	8.07	
135	0.24		185	2.55	
136	1.65		186	9.05	
137	0.71		187	3.56	
138	8.97		188	36.37	
139	4.68		189	2.89	
140	4.73		190	0.20	
141	22.32		191	3.53	
142	9.80		192	19.93	
143	18.16		193	7.08	
144	0.65		194	10.92	
145	1.62		195	15.41	
146	8.45		196	1.87	
147	4.26		197	5.30	
148	5.39		198	3.86	
149	0.31		199	14.13	
150	0.28		200	9.45	

TABLE 5-2. TEST 6 EVENT YIELDS (Continued)

EVENT NUMBER	YIELD (%)	COMMENTS	EVENT NUMBER	YIELD (%)	COMMENTS
201	1.88		251	7.80	
202	14.56		252	0.92	
203	5.62		253	24.39	
204	9.00		254	14.37	
205	8.88		255	18.67	
206	3.29		256	14.54	
207	7.15		257	4.23	
208	4.99		258	0.03	Propellant Event
209	2.26		259	34.04	
210	19.16		260	9.81	
211	14.74		261	7.55	
212	23.14		262	1.05	
213	5.11		263	0.47	
214	30.72		264	4.14	
215	3.21		265	4.67	
216	31.82		266	5.24	
217	9.10		267	42.51	
218	3.10		268	13.60	
219	3.21		269	6.88	
220	1.34		270	7.00	
221	1.56		271	8.93	
222	23.71		272	31.32	
223	25.87		273	16.78	
224	0.41		274	5.31	
225	10.70		275	19.22	
226	12.44		276	15.54	
227	2.42		277	7.16	
228	1.26		278	32.81	
229	45.50		279	1.19	
230	3.32		280	2.90	
231	20.10		281	15.82	
232	1.25		282	0.01	Propellant Event
233	7.06		283	13.06	
234	11.69		284	1.08	
235	9.48		285	0.51	
236	3.99		286	11.92	
237	8.25		287	3.18	
238	3.30		288	15.36	
239	5.72		289	28.29	
240	32.94		290	15.37	
241	0.62		291	16.95	
242	17.96		292	25.62	
243	2.02		293	17.60	
244	3.71		294	13.77	
245	11.91		295	3.47	
246	0.55		296	23.27	
247	2.20		297	8.90	
248	3.52		298	6.28	
249	22.94		299	19.74	
250	14.06		300	15.85	

TABLE 5-2. TEST 6 EVENT YIELDS (Continued)

EVENT NUMBER	YIELD (%)	COMMENTS
301	10.17	
302	49.78	
303	38.53	
304	25.65	
305	42.25	
306	15.45	
307	11.32	
308	7.03	
309	20.81	
310	6.86	
311	18.46	
312	30.71	
313	49.18	
314	7.36	
315	19.01	
316	10.77	
317	14.16	
318	35.76	
319	57.81	
320	31.64	
321	19.77	
322	31.93	
323	24.26	
324	49.78	

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